IRON & COAL

THE IRON AND COAL TRADES' REVIEW

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Efficient cleaning of coal from 2" down to ¼", ⅜" or below, providing the raw coal can be screened at these lower sizes.

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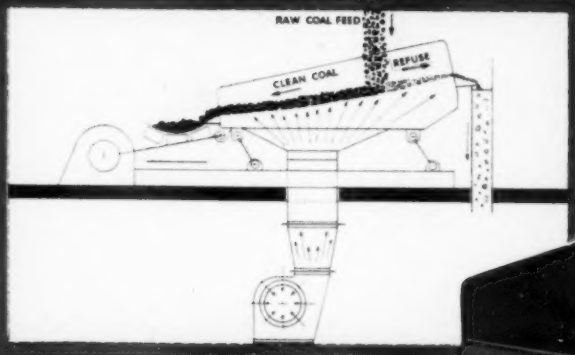

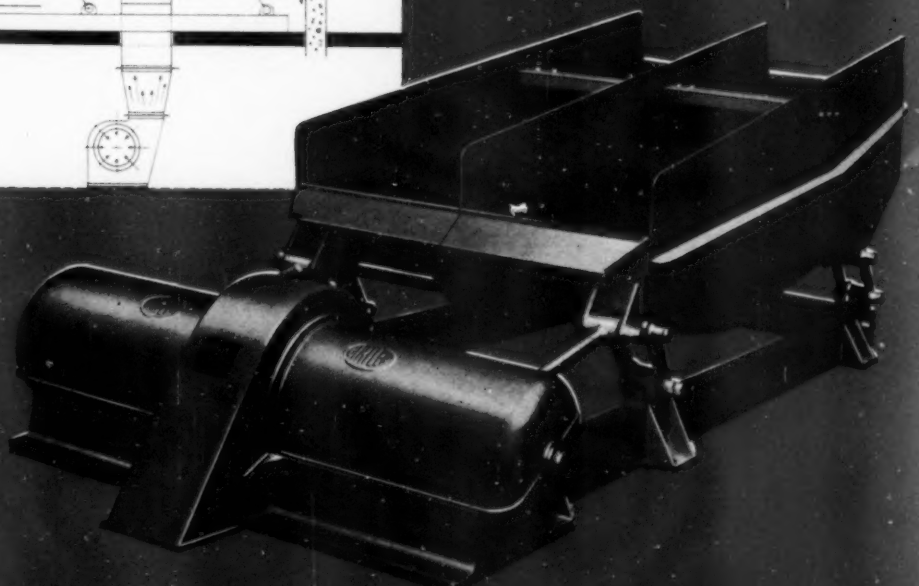

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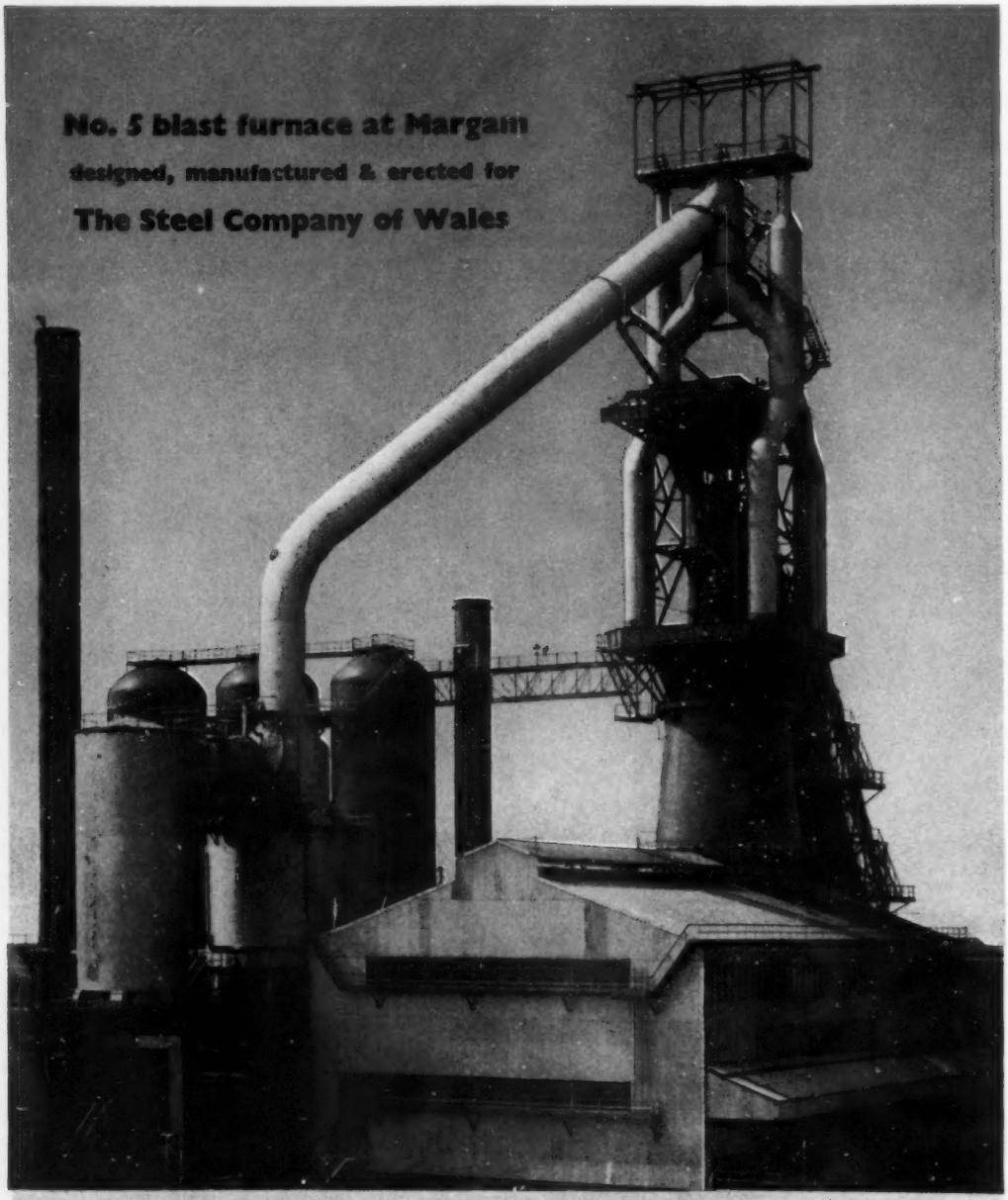

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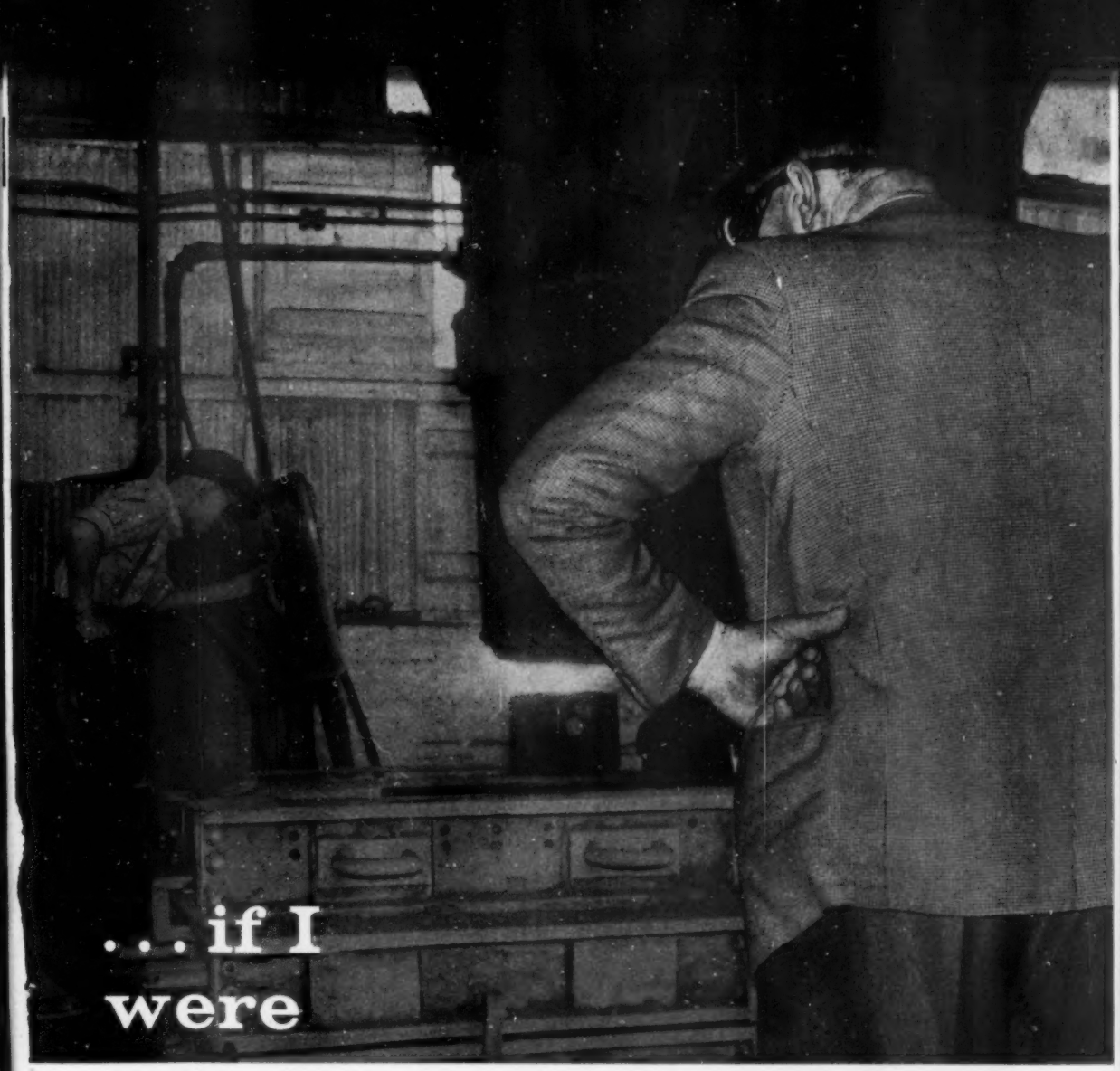


a Q.C.

". . .'Members of the Jury' I'd begin—and I reckon that would be my lot.

"You want a cool, calculating brain to tackle a job like that. Every step planned in advance—on your toes every minute of the day and heaven help the client if you make a mistake.

"A bit like casting a roll when you come to think of it—except for the talking. Always one move in front of the metal, every detail worked out to a hair-breadth and all the time Charlie, the crane driver, is sitting in his box like a blooming judge.

"As for the Jury? Well, I reckon all of us at AW fill that bill, but speeches won't sway us—it's the **result** that counts here."

CLOSELOY ROLLS – perfection in Roll technique

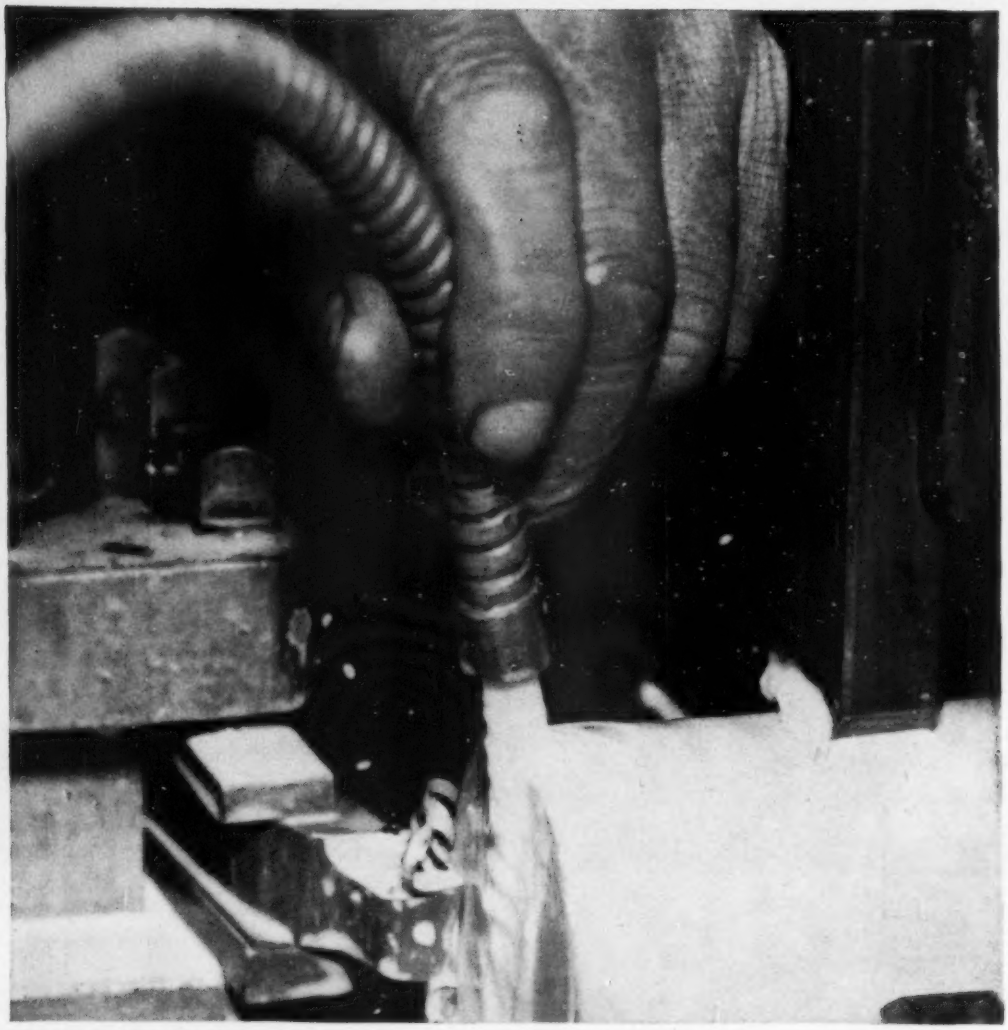
AW

ARMSTRONG WHITWORTH (METAL INDUSTRIES) LIMITED

Close Works, Gateshead 8, Co. Durham. Tel: Gateshead 71261

Steel Foundry: Western Road Works, Jarrow, Co. Durham

Shell achievement

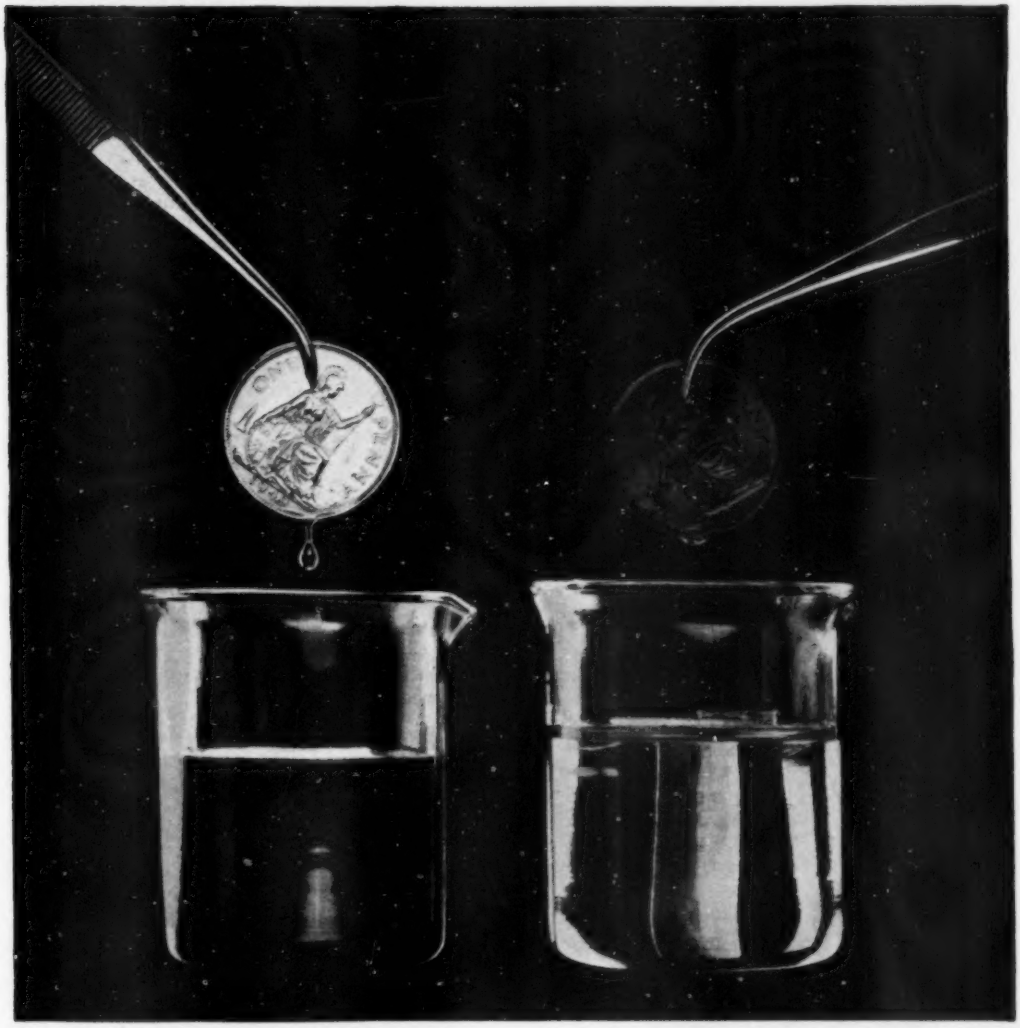


One of Shell's recent achievements in Industrial Lubrication has been to reduce the risk of skin trouble for machine operators. Until the new Shell Dromus range, most modern soluble cutting oils contained phenolic compounds, which can cause skin irritation. They were used as coupling agents between the actual oil and the emulsifier. On high-speed machines, especially, the water evaporates and the emulsion concentrates. And that's when the trouble can start. Shell scientists found a better coupling agent, and made it work. And now, at no extra cost, management can reduce working risks for their staff. *Write for the book, 'Selecting Your Cutting Oils', to Shell-Mex House, London.*

SHELL

SHELL INDUSTRIAL OILS

Shell demonstration



Two clean, bright pennies are placed in beakers of oil, of equal performance level, one a Shell cutting oil and the other a conventional cutting oil, both containing sulphurised additives. After three hours at room temperature one penny is still bright and stain-free, the other heavily stained with black copper sulphide. The bright penny is from the beaker containing the Shell cutting oil, the blackened one from that containing the conventional oil.

While these were just pennies, they could have been bronze bushes in your machine tools—stained in less than half a shift. Sulphur is essential in heavy-duty cutting oils. Special additives in Shell Cutting Oils protect your machine tools and yet allow the sulphur to do its job.

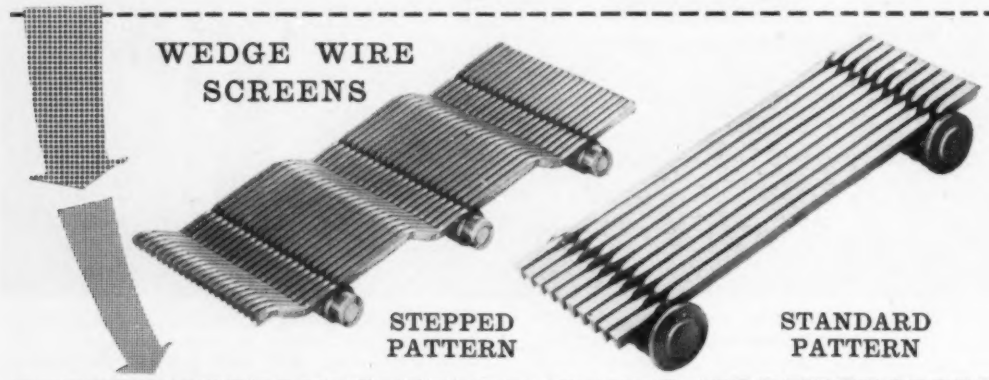
Write for the book 'Selecting Your Cutting Oils' to the Lubricant Department, Shell-Mex House, London, W.C.2.

SHELL

SHELL CUTTING OILS

For a long trouble-free life

In the field of industrial screening, Greenings have an unrivalled reputation for efficiency and reliability. Woven wire and perforated metals are precision-made in all commercial metals for all industrial uses. Greenings wedge wire uniquely combines two important features required for maximum screening efficiency—Free Clearance and Mechanical Strength. The revolutionary stepped wedge wire has dealt with up to twice the feed taken by conventional screens without overloading.



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abrasion-resisting alloy outlasts chilled iron by 3-5 times

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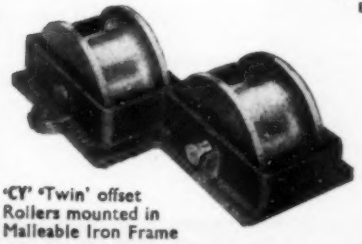

'CY' 'Twin' offset Rollers mounted in Malleable Iron Frame

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SPEEDY WITHDRAWAL!

Bathgate Wedge Props are rapidly set—by simply driving home the wedge—and just as easily withdrawn. These features, plus the simplicity of the Prop—no complicated parts to go wrong—make possible the regular maintenance of a smooth cycle at power-loading faces.

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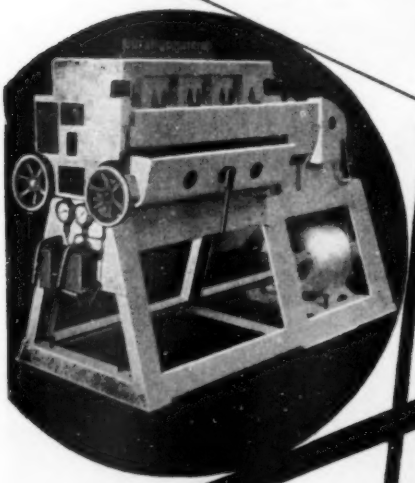
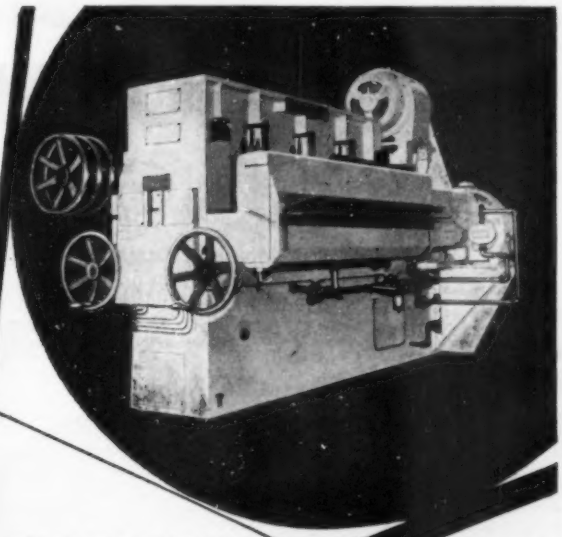
WP 66

aluminium foil or armour plate

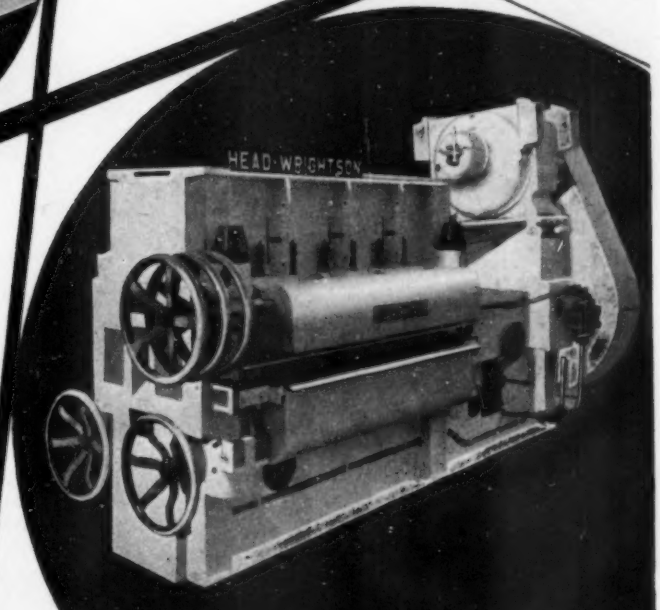
Left: 1½" Pressure Regulating Roller Leveller





Top: 1¾" Processor Leveller

Bottom: 2½" Pressure Regulating Roller Leveller



The Head Wrightson Machine Company manufactures a very wide range of roller levellers for levelling from aluminium foil to heavy steel plates. Further information is available on request and our Sales Engineering Department will be pleased to give advice. For immediate service telephone Middlesbrough 43401.

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DK 9/51—For Methane Drainage, Proving and de-watering in normal strata. Can also be fitted with two-speed gear box for Diamond Coring.

HBM50/HY—For boring holes up to 32" dia. This electro hydraulic machine is used for Ventilation Linkages, Staple Shafts and Stowage Chutes.

Photo by courtesy of the N.C.B. S.W.2 Area

DK 9/6 8—S rotary/rotary percussive drilling machine specially designed for Methane Drainage drillings in the harder rocks. This type of drilling does away with excessive tungsten carbide bitwear as well as the low penetration rates associated with the use of diamond assemblies when drilling in most of the harder rocks.

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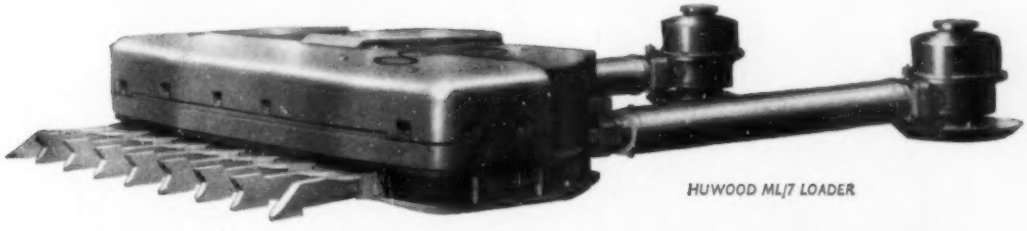
The term 'sixes and sevens', which stands for confusion and general mayhem, has acquired an entirely new meaning since the introduction of the Huwood ML/7 Loader. With its slightly older and taller sister, the ML/6, it is making a formidable attack on the problem of low seam mechanisation. The ML/6 is 1′ 9″ in height, the ML/7 is 1′ 4½″ in height and of slightly greater width. Both offer the advantage of requiring a low capital investment appropriate to the seams in which they are used. Both minimise coal degradation. Both are hydraulically propelled and both are noted for quiet and efficient production.

The difference between 'sixes and sevens' and 'ML sixes and sevens' is something much appreciated in the mining industry of today.

HUWOOD ML/6 LOADER ON THE FACE



HUWOOD ML/7 LOADER

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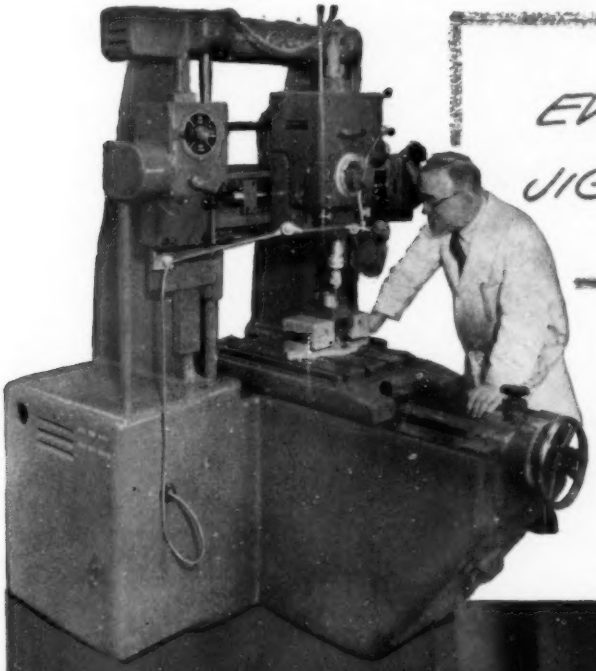
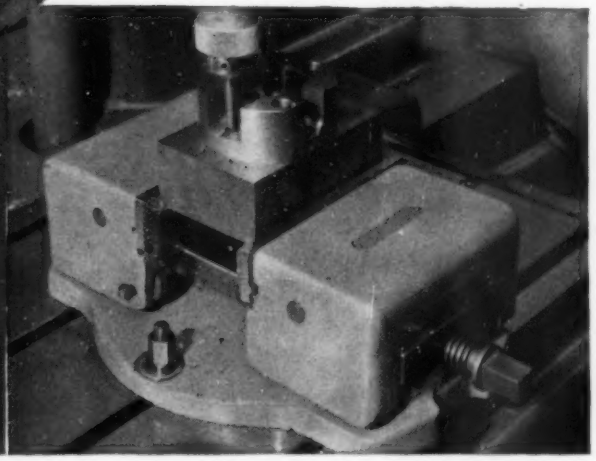


EVEN ON A JIG BORER...

Here is a Machine Vice with built-in precision. As its name implies, it actually grips the work hard down onto its table or parallels. An accurate set-up in seconds!

The illustrations show the boring of a location pin hole in a fuel pump assembly fixture at the premises of Messrs. AC-Delco, Liverpool, by whose courtesy the photographs are reproduced.

THE DORMER DOWN GRIP MACHINE VICE



✳ BUILT AS A MACHINE TOOL — FOR EFFORTLESS PRECISION

THE SHEFFIELD TWIST DRILL AND STEEL COMPANY LIMITED
SHEFFIELD ENGLAND
DORMER TOOLS ARE OBTAINABLE FROM YOUR USUAL ENGINEERS' MERCHANTS

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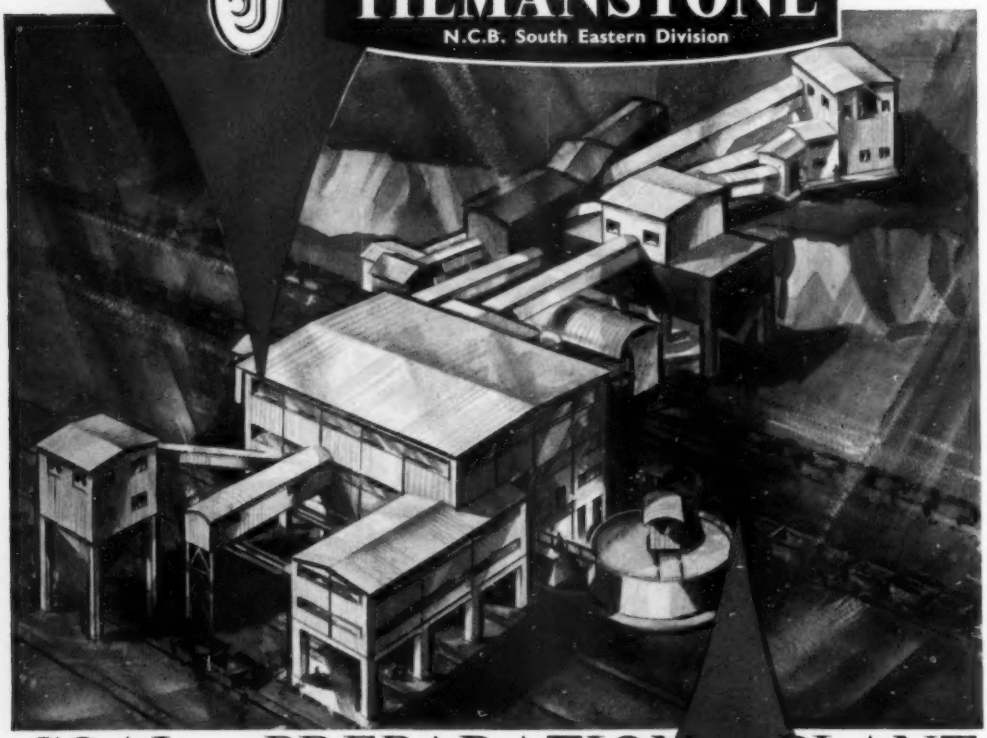
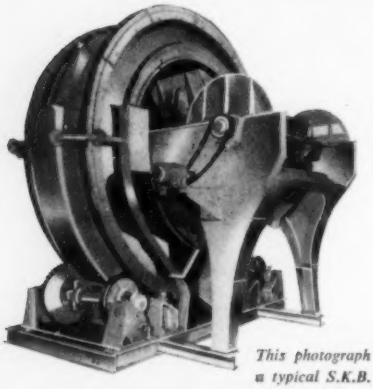


COAL PREPARATION PLANT

by Jenkins of course!



This photograph shows a typical S.K.B. Dense Medium bath.

The above drawing is an artists impression of the new Coal Preparation Plant to be erected at Tilmanstone. It will handle 250 tons of coal per hour and incorporate the first Schuchtermann and Kremer-Baum 'Teska' Dense Medium Washers to be installed in this country.

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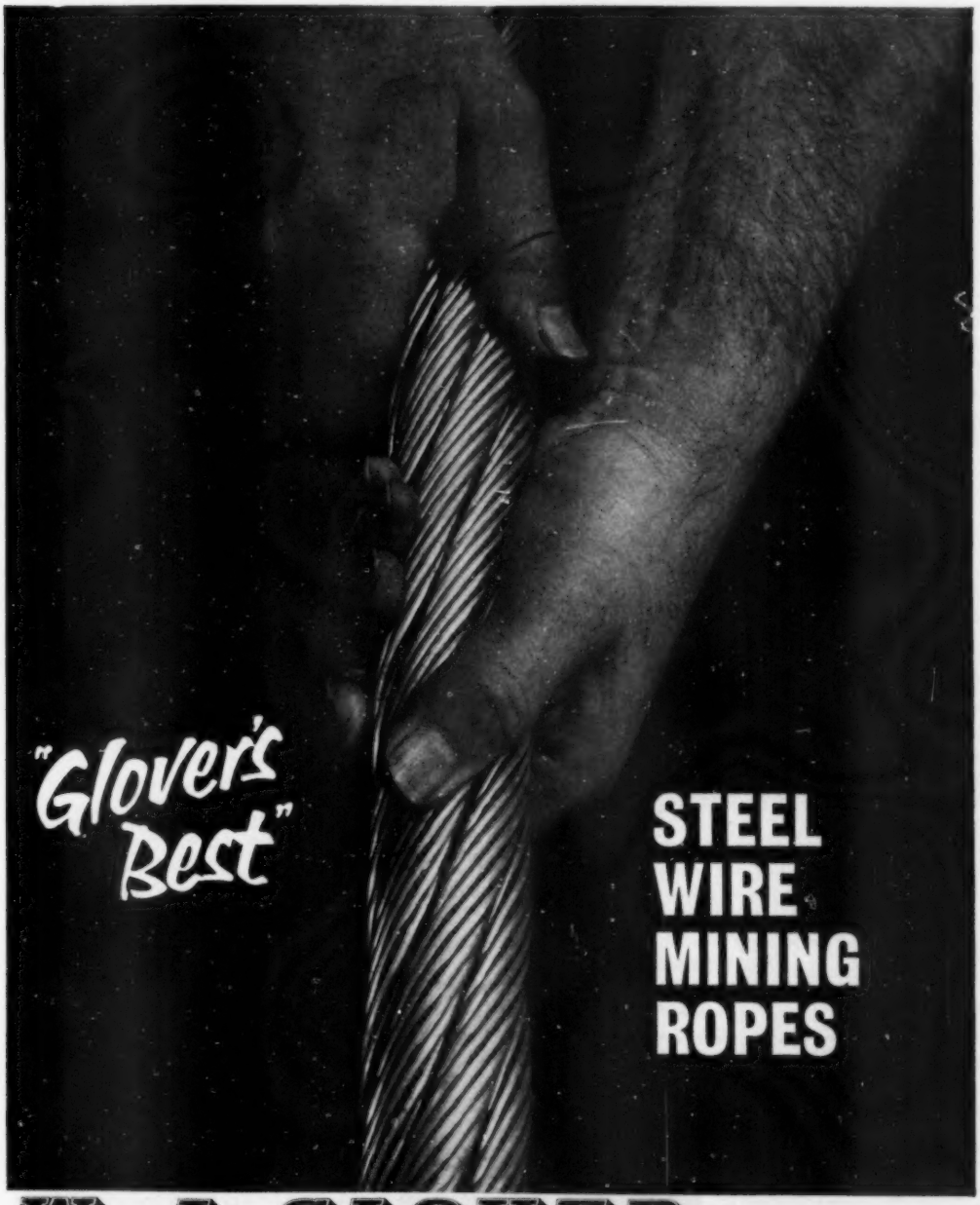

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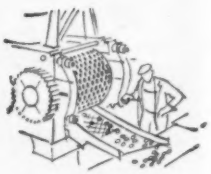

Briquetting enables fine pulverulent materials, metal bearing ores, ferrous and non-ferrous swarf to be used economically. It makes handling, transporting and stocking easier and, where the material is required for processing, it can improve production.

Sutcliffe, Speakman will be happy to discuss with you this method of utilising materials to the best advantage. They can give expert advice on the type of press needed, and they will install it and gear it to your precise requirements.

Sutcliffe, Speakman Ovoid Presses can produce briquettes and pressings at high speed : they can briquette coal dust and fines, with suitable binder, at varying rates up to 25 tons per hour. Their Emperor Press can briquette ferrous and non-ferrous borings and turnings, coal with or without a binder as well as make bricks from non-plastic and semi-plastic materials.

... ask **SUTCLIFFE SPEAKMAN** about briquetting

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Yes, TAYLOR JUMBO versatility ensures consistent, cost-cutting efficiency all around the yard. Equipped with deep-digging hydraulic grab, TAYLOR JUMBO cranes handle all classes of coal with minimum spillage, negligible breakage—speed your transport turnround.

CONVERSION FROM GRABBING MACHINE TO LIFTING CRANE WITH HOOK ACCOMPLISHED IN MINUTES.

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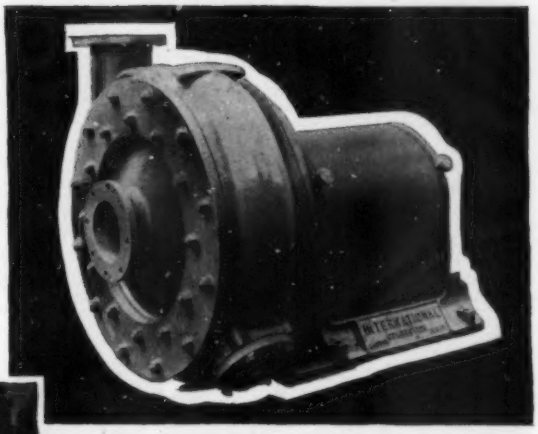

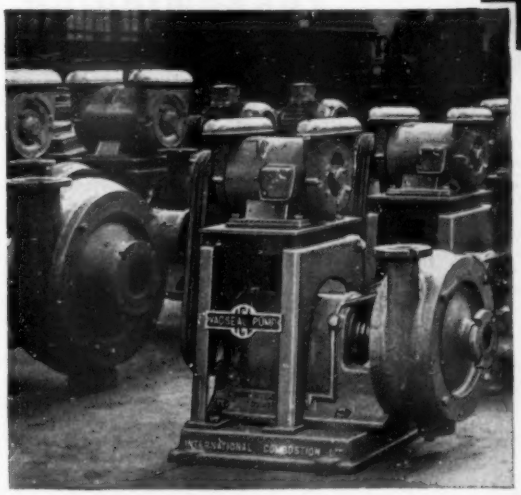

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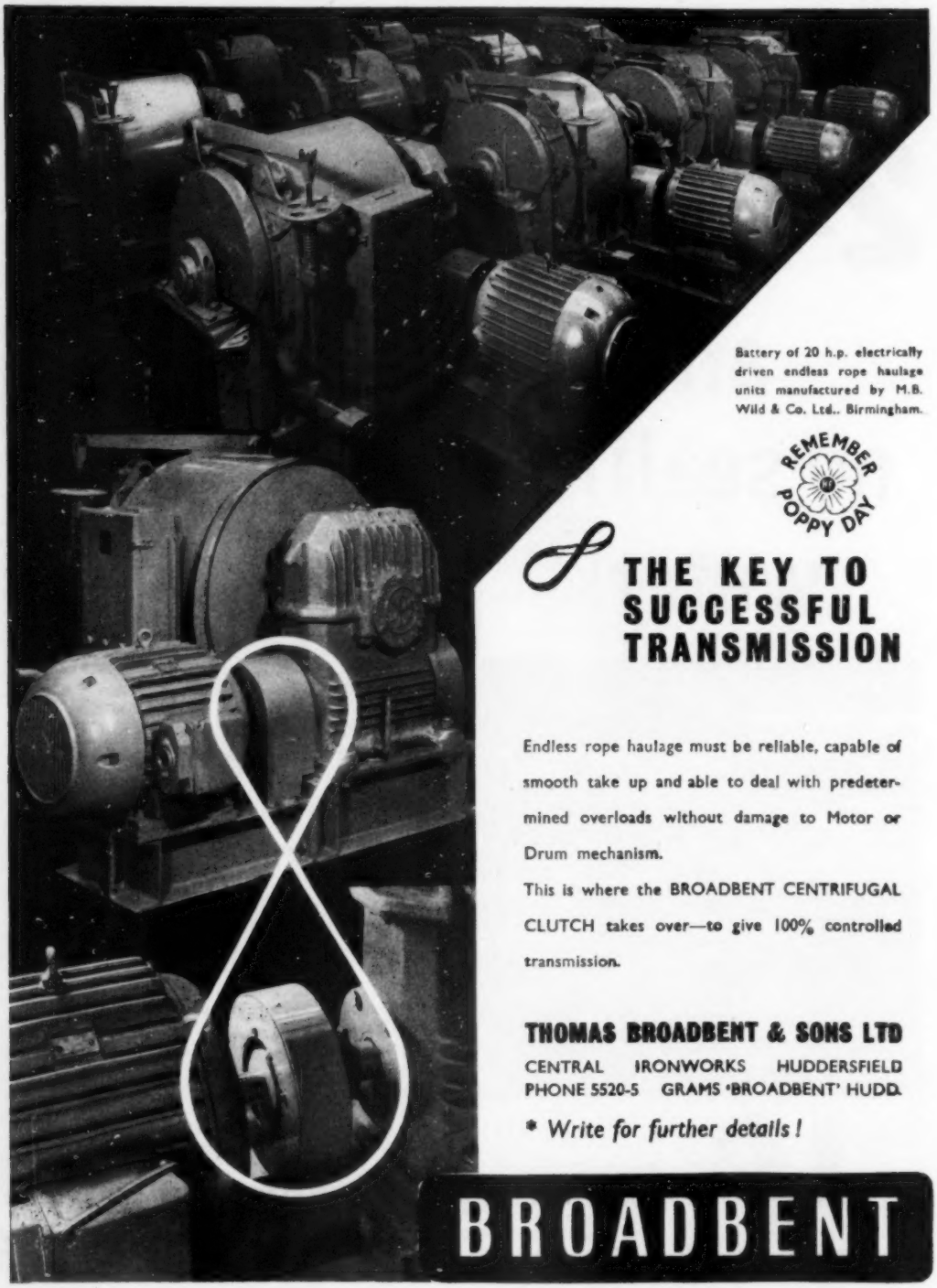

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THE KEY TO SUCCESSFUL TRANSMISSION

Endless rope haulage must be reliable, capable of smooth take up and able to deal with predetermined overloads without damage to Motor or Drum mechanism.

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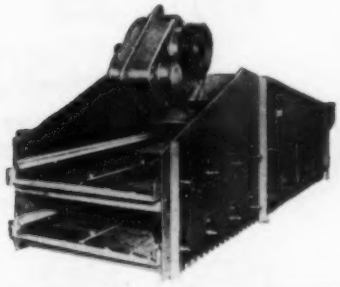

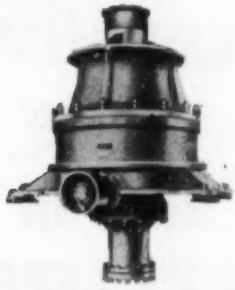

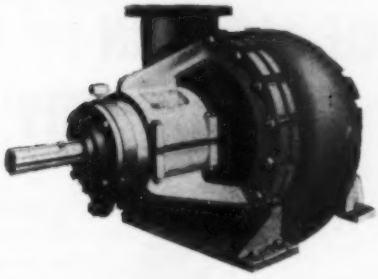

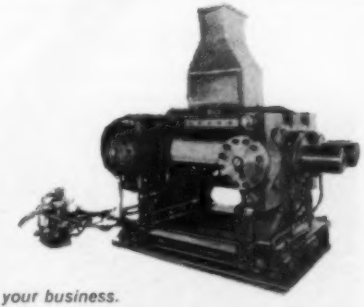

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Designed for high-efficiency, abrasion resistance and ease of maintenance in handling of sand, gravel, coal, rock products, dredge water, ore tailings and other solids in suspension.

Allis-Chalmers Compactors and Granulators—
These convert or upgrade particle size to make good use of waste fines by converting them into saleable, granular products. They increase the bulk density of the material and provide a uniform solubility rate. The equipment has been proved in use in steel, salt, fertilizer, sewage, chemical and pharmaceutical industries.

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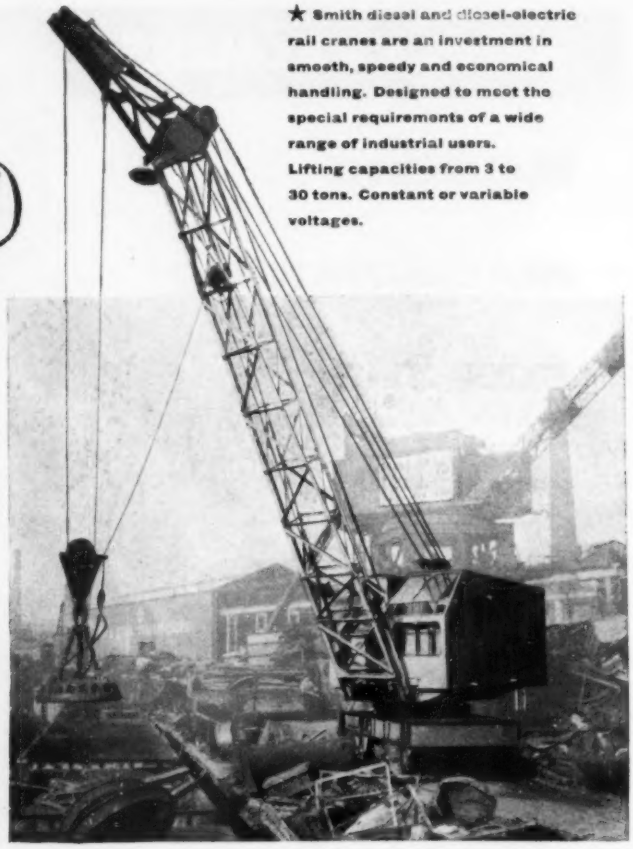

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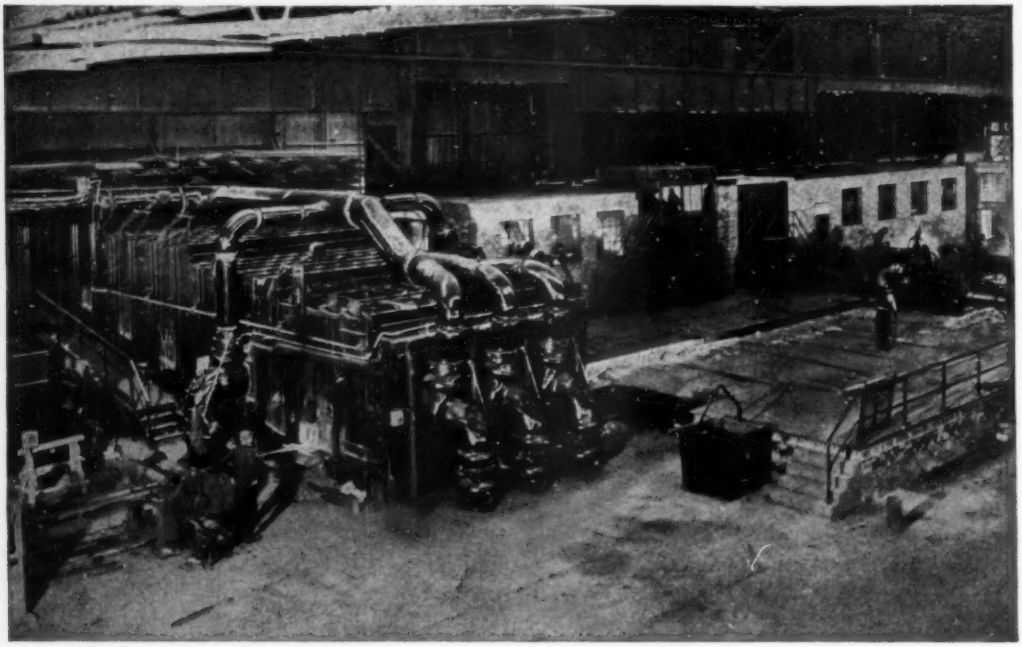

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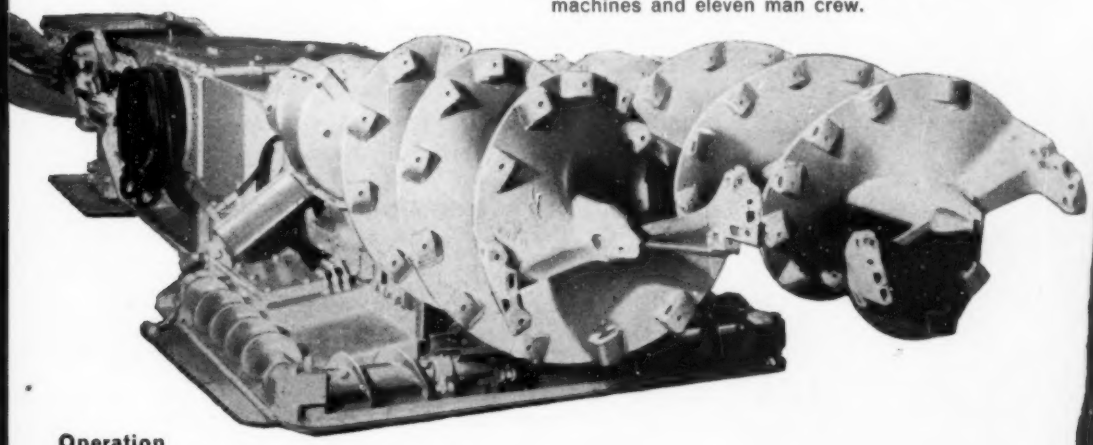

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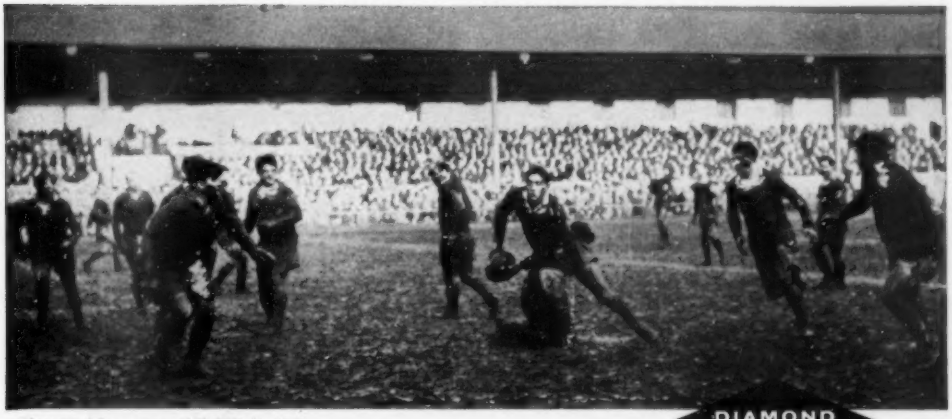

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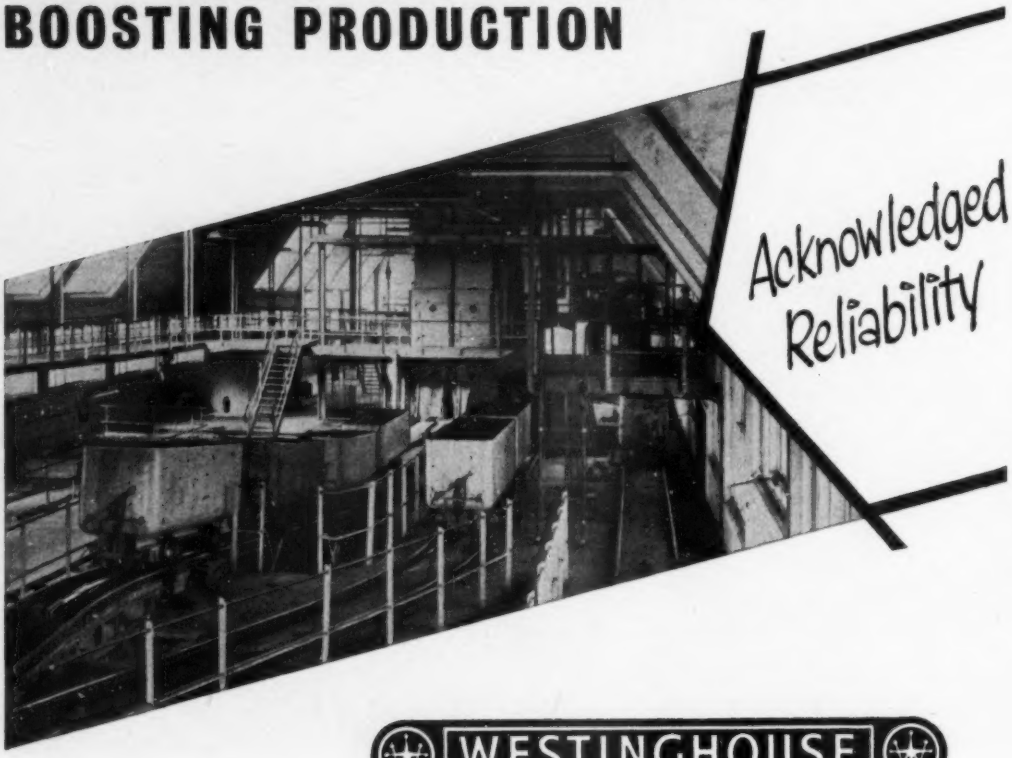

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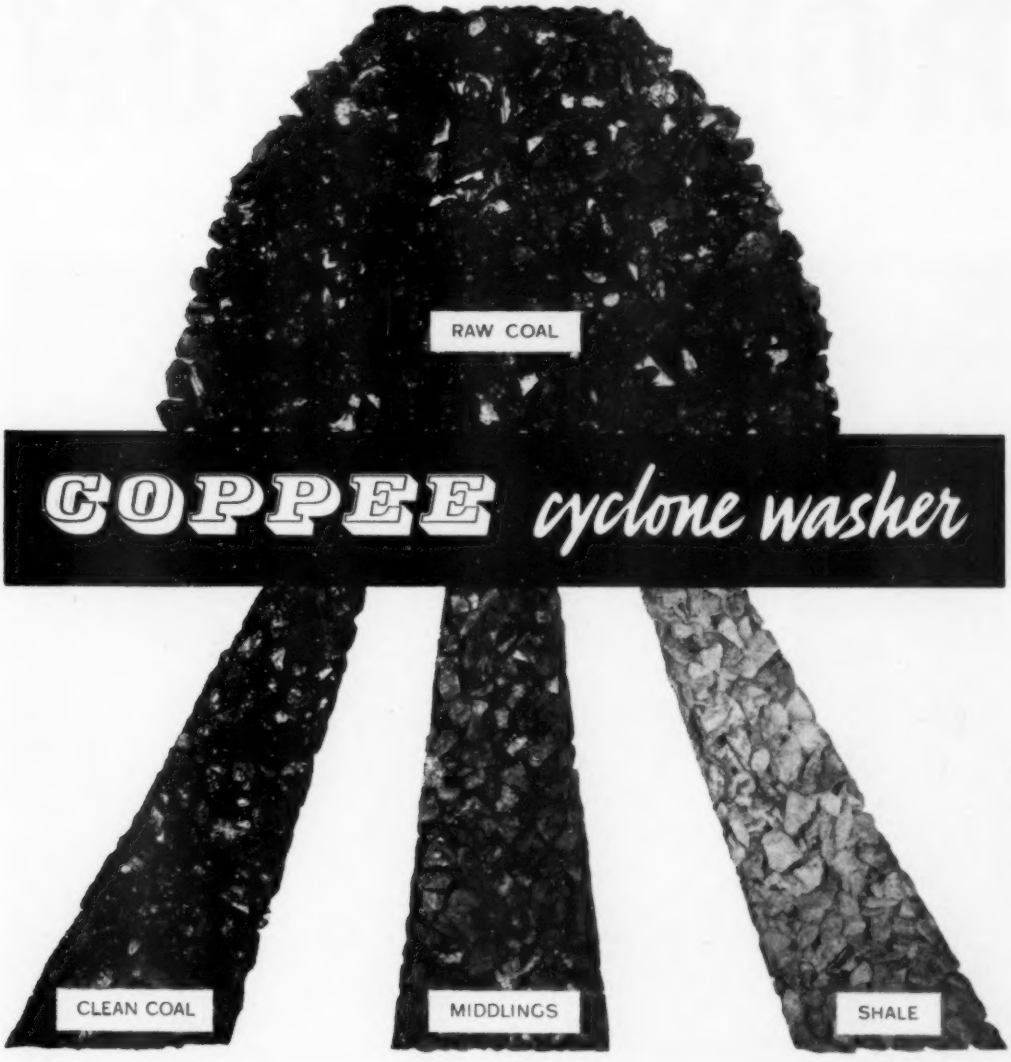

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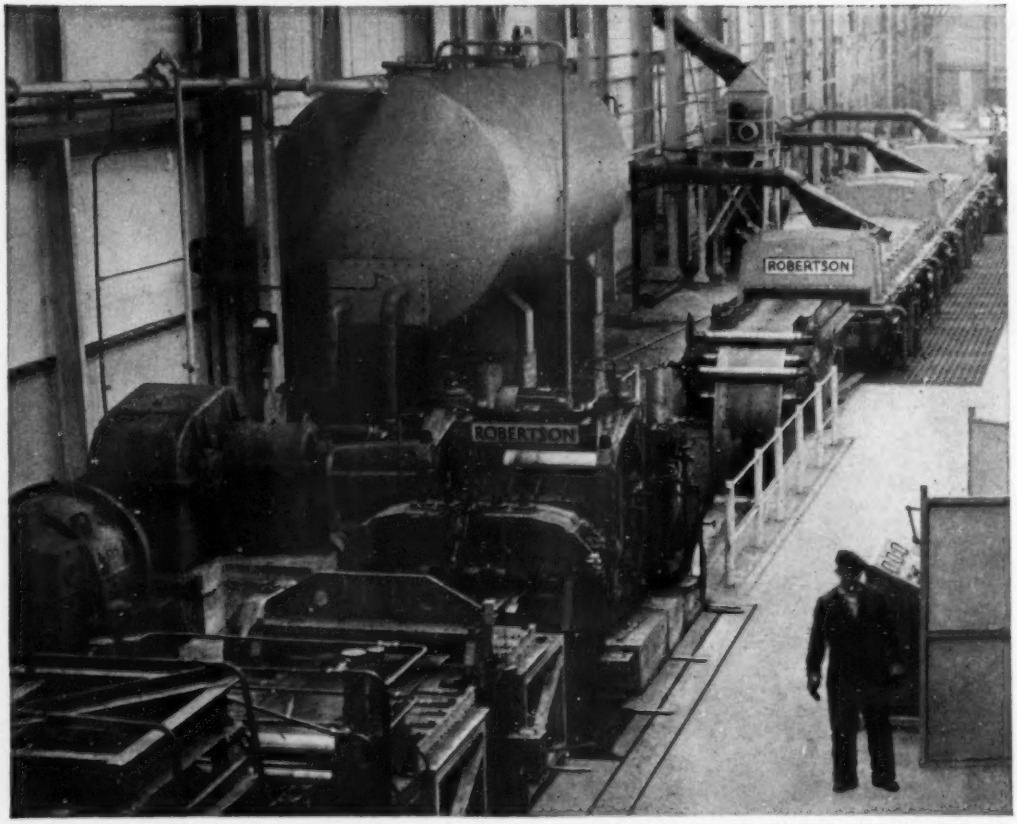

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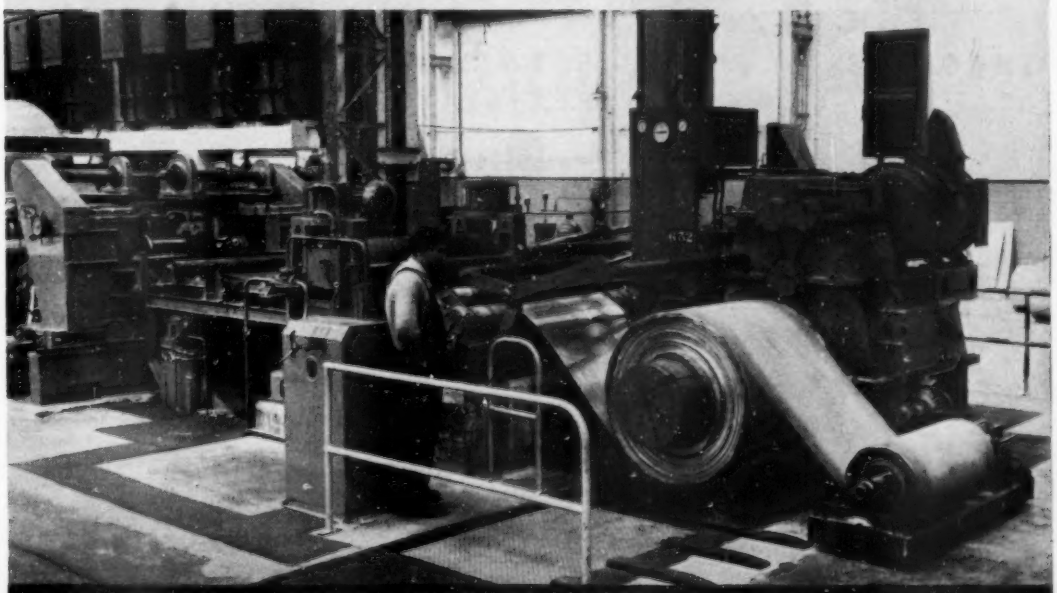

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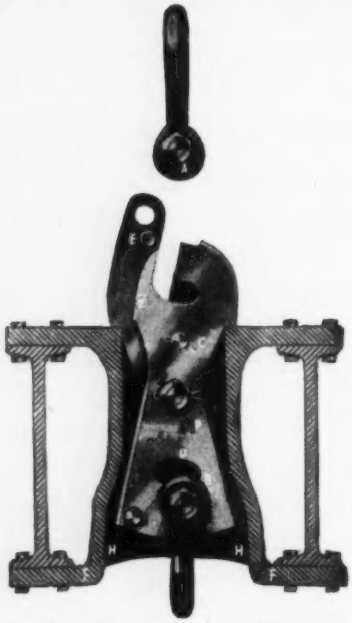

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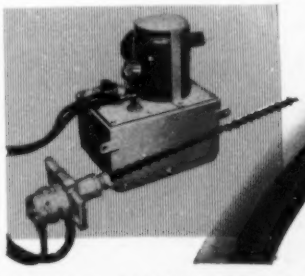

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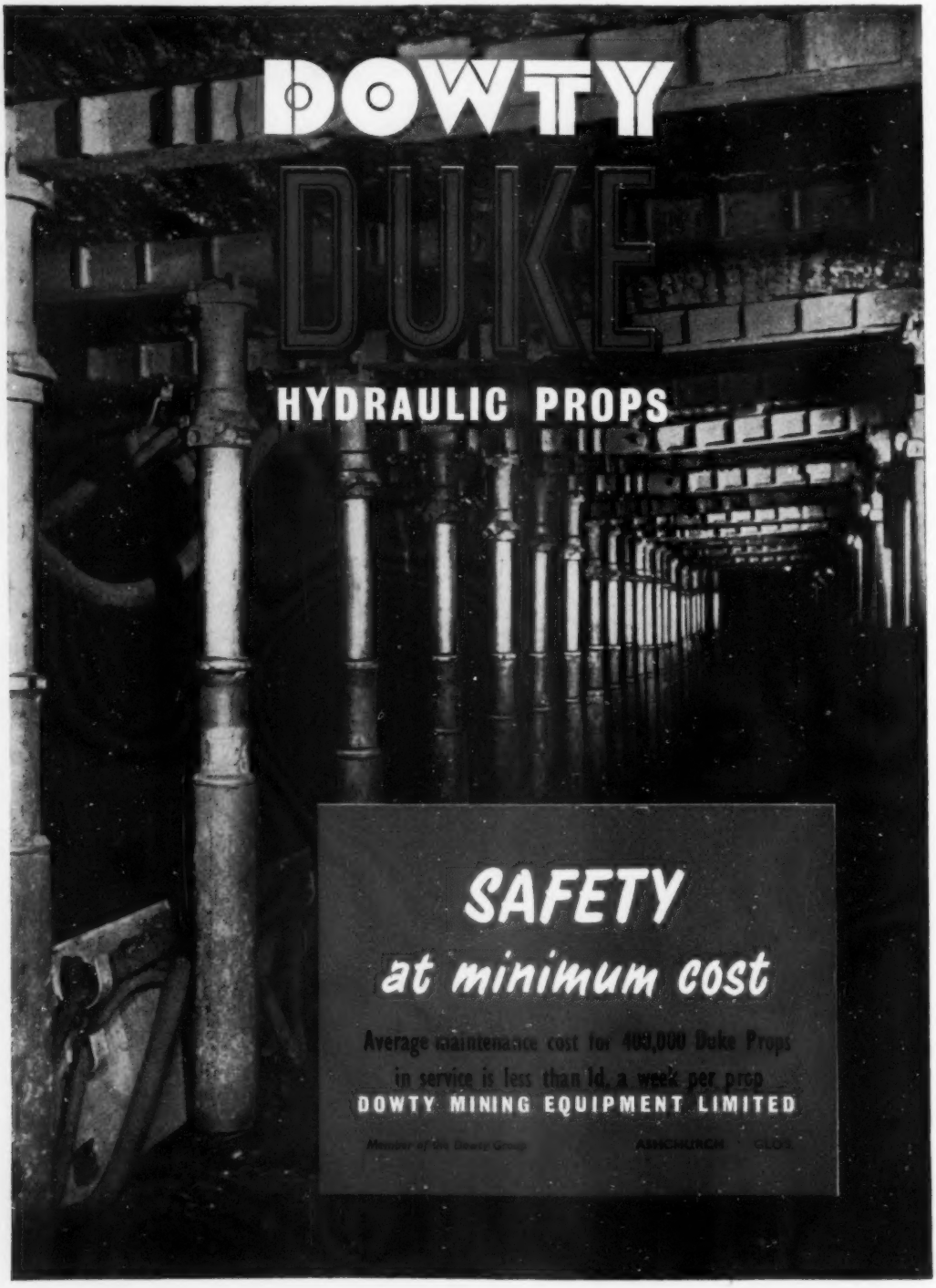
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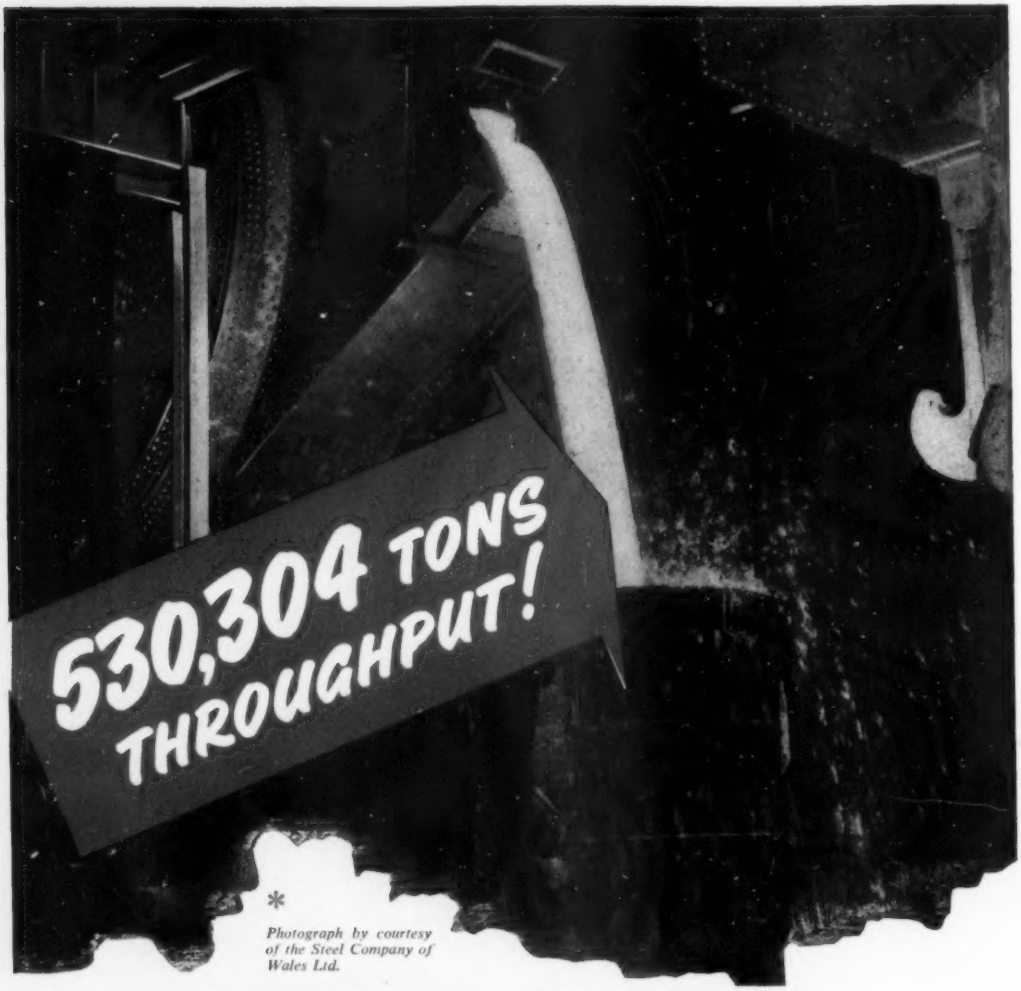

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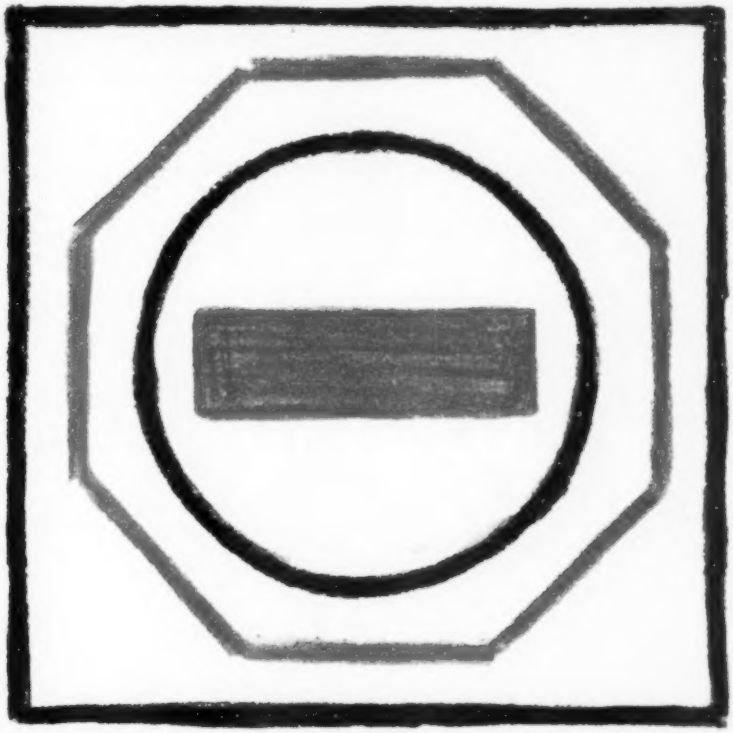

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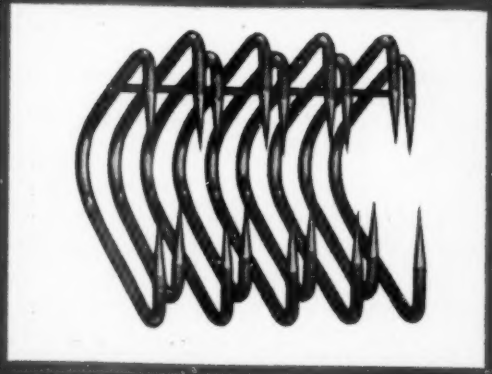

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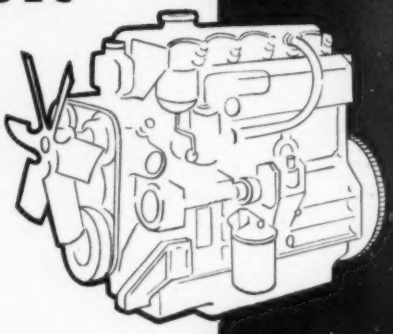

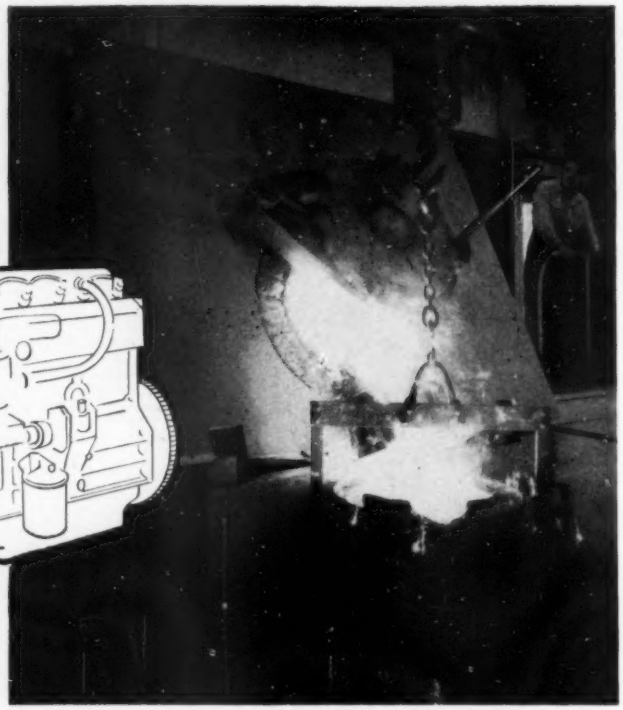

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Vol. 183
No. 4865

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In this Issue—

IRON AND STEEL INSTITUTE
Works Visit: Armco Steel Corporation - - - page 781

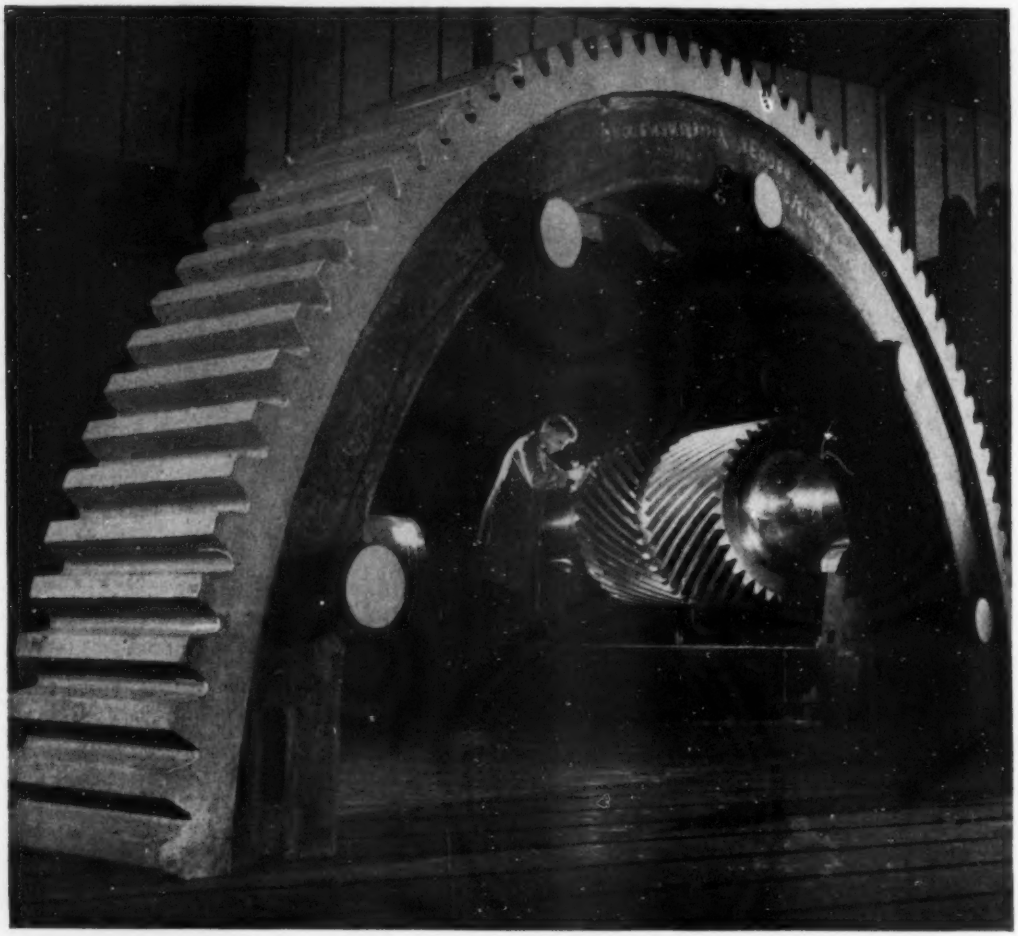
SPONTANEOUS COMBUSTION IN MINES
Development of a Latex Sealant - - - - page 785

COAL MINING IN SOUTH AFRICA
Survey of Current Production - - - - page 789

ALUMINIUM CONTENT OF STEEL
As a Measure of Grain Size - - - - - page 791

MINE MAINTENANCE AND MECHANIZATION
NCB Workshops and Stores - - - - - page 801

	PAGE
Leading Article: Future for Gas	771
Gas Council Report	772
New West Midlands NCB Board Members	772
Steel Company's Decision	773
Steel Output Down to 77 Per Cent. Capacity	773
Passing Thoughts	774
SCOW May Have to Close Port Talbot Works	774
Wage Negotiations	775
Pit Managers Urged to Give Strong Lead	775
Personal	776
Sir Peter Roberts Heads Hadfields	776
If Britain Joins	777
Board Changes	778
French Steel Market	779
Rhodesia to Expand Iron and Steel Industry	779
Standard Boardroom Practice	780
Gloucester Wagon Company to End Railway Work	780
Special Train for Sheffield Works Visit	780
Dewrance Appoints New Chairman	780
Guard for Coal-cutting Machine Operator	788
Remote Control of Hydraulic Chocks	788
Anti-breakage Boom Loader	790
Birmingham Exhibition of Fans and Dust-collecting Plant	800
Accidents at Mines	804
"Vimarc" Feeders, Conveyors, and Screens	804
NACM: South Wales Branch Annual Dinner	805
Coal for Westfield Lurgi Plant	806
Measurement of Smoke Emission from Industrial Boilers	806
New Literature	807
Progress Report from Daw Mill	808
Forthcoming Events	809
West Cumberland Metallurgical Society	809
New Developments in Coal Production	810
Mardy Colliery Halfway to Output Target	810
Security Scheme for Workers	811
BTC and Westinghouse Contract	811
Appointments	812
Brora Pit to Reopen with Miners Part-owners	812
Iron and Steel Trade	813
Sheepbridge Blast Furnaces to Close Down	813
£350,000 Extensions at Murex Works	813
Coalfield News	814
Saturday Work for East Midlands Miners?	814
The Coal Trade	815
Coal's 4.2 Per Cent. Drop in Manpower	815
Orders Placed	816
More Space for Super Oil Seals & Gaskets	816
The Scrap Markets	817
Sunderland Cranemakers' Expansion	817
Law Cases	818
Company News	819
Head Wrightson Chairman on Common Market Challenge	820
Fall in ICI's Half-year Profits	820
Obituary	820
Union Fears Steel Recession	820
News in Brief	822



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IRON & COAL
THE IRON AND COAL TRADES REVIEW

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Future for Gas

THE recent report of the Select Committee on the Nationalized Industries dealing specifically with the gas industry contains an instructive chapter on the future for gas, and discloses an element of disharmony regarding the policies pursued by the National Coal Board and the Gas Council. Coal, gas, and electricity are not today the same happy family that they once were. They have drifted a little apart. Mother coal senses something of a spirit of waywardness among her offspring, who, in turn, as so often happens in family life, are inclined to think that their parent wants to keep too tight a hold on the pursestrings. The concern of the coal industry is to retain a traditional customer. If change is inevitable, the National Coal Board feels that it should not be left out in the cold. The problem of the gas industry, on the other hand, is to abate its costs, and the Gas Council feels that the assistance of coal in new developments may to some extent be limited. The council's report for the 12 months ended March 31, published this week, complains that the 1960 coal price increase cost the industry £7,500,000 in a full year. It also discloses that proposals have been submitted to the Minister of Power for the importation of 350,000,000 therms of liquified natural gas a year from Algeria.

The cost of producing coal gas utilizing the conventional carbonization method is between 1s. and 1s. 3d. a therm on a favourable load factor. At this price it is difficult for gas to compete with its rivals in the fuel market. Costs should be substantially lower if the industry is to expand, and a figure of between 8d. and 8.5d. per therm has been suggested as desirable for gas delivered to the area boards. Contemporary supplies include water gas operating at a variable figure, but accounting for only 14 per cent. of total gas produced. Even smaller is the proportion allocated to "oil" gas, which costs between 9.2d. and 10d. a therm. This source accounts for only 2.2 per cent. of the gas available.

Two new methods of gas production have been suggested. The Lurgi process, developed in Germany for making town gas from low-grade coal, was subsequently utilized in the United Kingdom in a plant now in operation at Westfield, Fife. Another such plant is under construction at Coleshill, near Birmingham, and further plants are envisaged. Doubtless drawing benefits from continental operations, particularly in France, Italy, and Russia, where large quantities of indigenous natural gas are available, the Gas Council has diverted its attention to the prospect of importing liquified methane, re-forming it, and reticulating it through the mains of the area boards. Another scheme involves the importation of suitable petroleum feed-stock for cracking in units in the United Kingdom. Naturally, rivalry has developed between the National Coal Board and the petroleum industry for the privilege of serving the gas industry with its basic requirements—the coal industry, as suggested, to retain a traditional customer, and the oil industry to enlarge its sphere of operations in yet another British industry. As in most things price is likely to be the chief determinant, and so far the competitors have been assessing one another's projects.

The National Coal Board believes that gas could be made in a large-scale Lurgi plant at a delivered price of between 8.25 and 8.5d. a therm. It indicates that technical improvements have already been derived from the Westfield plant. The lean gas is enriched by liquid petroleum gases such as butane or propane or by a mixture of both. As a source of enrichment, imported methane will be fractionally cheaper. The National Coal Board believes that another form of enrichment for Lurgi gas may become available, but as yet no details have been disclosed. While the Lurgi process results in the complete gasification of coal, in contrast with the carbonization process, which produces coke as a by-product, the effluent has yet to be disposed of. The Gas Council is reluctant to accept 8.25 to 8.5d. a therm as a realistic estimate for Lurgi gas, and is disturbed at the steady increments in coal prices during the past 10 or 15 years. According to the Desford study, commissioned by the Gas Council and made available in 1959, a site in the East Midlands was chosen for a plant with a capacity of 109,000,000 cu. ft. a day, which was considered to be the economic size for a Lurgi plant. The Desford plant was, however, rejected, on the assumption that it did not reveal a good prospect of making gas cheaply enough, and the small plants already mentioned were scheduled to be built. There is ample scope for further study on the merits and technical achievements secured in plants located abroad, particularly in Dorsten, Germany, and the USSR. The present position would seem to be that the National Coal Board and the Gas Council have agreed to re-examine the case for Lurgi gas as a large-scale operation.

When the Gas Council reached the conclusion that a process based on coal would not provide gas at a price that would enable the area boards to match the costs of their rivals, interest turned to

a comprehensive study of the potentiality and possible use of methane. Statistically a good case could be made out for this imported fuel. The question arose whether it was economic and a technical proposition on the assumption that it was necessary to liquify methane at an expensive plant abroad and ship it in special tanks at a low temperature. The stability and source of supplies had to be correctly evaluated, and the dollar element of the process had to be reckoned in its impact on Britain's balance of payments. The voyages of the Methane Pioneer proved the method to be a technical success, and it became a reasonable possibility that, provided a sufficient volume was imported, methane could be delivered at a price more favourable than that obtainable at Lurgi plants. According to the Select Committee, the price of re-formed gas would be between 8½d. and 8¾d. a therm.

Another method that is being studied is the importation of petroleum feedstock from abroad in conventional tankers for cracking in units specially built in Britain. The method also offers the advantage of relative cheapness and would, it is considered, fit neatly into the supply pattern. Later, when methane derived from the Sahara reticulates in the mains of Europe, linking with the Lacq field in south-west France the deposits in Italy and Holland, the construction of a pipeline across the channel is envisaged. Before that happens, the problem of how best to make use of our natural resources and at the same time take advantage of the availability of energy within easy reach from abroad will have to be settled.

GAS COUNCIL REPORT

RECORD sales of gas last year gave the industry a profit of more than £2,000,000, after all charges had been met. This compares with a loss of nearly £2,400,000 the previous year. The annual report of the Gas Council, published on Tuesday, states that increases in the cost of coal—amounting to about two thirds of the annual cost of producing gas, continue to be a matter of concern to area boards.

Coal used during the year amounted to 22,000,000 tons, and, because of the increase in coal prices, the gas industry had to pay an extra £7,500,000. In 1945, the total amount of gas supplied based on coal was 92.8 per cent. In 1959-60 it was still 87 per cent. Today, well over 80 per cent. of gas produced is still derived from coal in one way or another.

Coke and breeze sales rose to £85,300,000 (£80,200,000) but, according to Sir Henry Jones, chairman of the Gas Council, the industrial/commercial section, to which two thirds of all coke sales went previously, is contracting because more oil is being used for heating purposes.

Exploration investigating the possibility of storing gas underground in suitable geological structures has yielded promising results at a site in Hampshire.

New West Midlands NCB Board Members

THE National Coal Board has appointed Mr. T. Jameson and Mr. P. M. D. Roberts to succeed Mr. J. Jones and Mr. G. Essame, respectively, as industrial relations director and staff director on the West Midlands Divisional Coal Board. The appointments take effect from November 1. Mr. Essame was recently appointed principal of the NCB staff college and Mr. J. Jones has decided to retire at the end of the present month on account of ill-health.

For the past 10 years, Mr. Jameson has been general manager of the West Midlands Division's South Staffordshire and Shropshire Area. Between 1927 and nationalization of the coal industry he held managerial posts at Wigan and then at Chatterley-Whitfield Collieries, North Staffordshire, before becoming agent and general manager first of Collins Green Collieries, St. Helens, and, from 1943, of Gresford Colliery, North Wales. Since nationalization he has served entirely in the West Midlands Division. He has been successively technical adviser to the production director, sub-Area agent, acting mining engineer and acting general manager of the division's Warwickshire Area.

In 1941 he was decorated by King George VI with the Edward Medal (the mining industry's VC) for the part he played in rescuing alive three men who were buried for 36 hours beneath a fall of roof in underground workings.

After graduating at Oxford, Mr. Roberts served with the Ministry of Fuel and Power from 1942 to 1945. Between 1945 and May, 1946, when he was appointed personal assistant to Lord Hyndley, chairman-designate of the National Coal Board, he was assistant to the general manager of the Finance Corporation for Industry. In 1949 he transferred, on promotion from the NCB chairman's office to the board's central secretariat, of which he became head in 1951. From 1955 to 1959 he was staff director of the East Midlands Division. Since 1959, when the post was newly created, he has been director of administration in the marketing department at the board's London headquarters.

British Empire Medals

AWARDED for meritorious service in the 1961 Birthday Honours, British Empire Medals were presented by the Minister of Power, Mr. Richard Wood, to over 20 members of the coal, electricity, gas, oil, and steel industries, at Lancaster House, London, on Wednesday.

Awards in the steel industry went to Mr. W. R. Reed and Mr. S. Scott, and in the coal industry to Mr. D. J. Brown, Mr. E. M. Cope, Mr. G. M. Hanson, Mr. C. Harris, Mr. J. Henderson, Mr. W. Holmes, Mr. L. Lavelle, and Mr. F. Phillips.

A HOT METAL mixer type car destined for the Margam works of the Steel Company of Wales, Limited, has left the works of Head, Wrightson & Company Limited, by rail on a journey which might take three weeks because only week-end travel will be possible. With a capacity of 180 tons, the car is believed to be the largest of its type in the country and will be used to transfer molten metal from the blast furnaces to the steel plant.

Steel Company's Decision

PART SUSPENSION OF APPLEBY-FRODINGHAM PLAN

SLOWING down of the expansion and development of the United Steel Companies, Limited, was announced on Monday, when it was learned that work on a major part of the £28,000,000 modernization and development scheme at the Scunthorpe works of the Appleby-Frodingham Steel Company has been suspended. It is the company's intention to proceed with the rod/bar mill scheme to the original timetable.

A spokesman for the company said that a reappraisal of the raw material needs of Appleby-Frodingham over the next year or two had been made in the light of current trade conditions. This review indicated that the expected deficit of iron within the company from the end of 1962 would not arise until later.

In these circumstances, it had been decided to suspend the completion of part of the expansion project at the ironworks, particularly the additional facilities for ore preparation.

Output Figures

The Appleby-Frodingham scheme—one of the largest currently in progress—was planned for completion during 1964 and was due to raise the annual capacity for producing pig-iron from 1,500,000 tons to 1,950,000 tons.

Output of ingot steel by the United Steel Companies, Limited, during the financial year ended September 30, 1961 (52 weeks), was 3,184,236 tons, a drop of about 100,000 tons on the previous year's figure of 3,284,170 tons (53 weeks), which was an all-time record for the company. Pig-iron production showed a decrease of approximately 85,000 tons from the previous record level of 2,008,094 tons to 1,923,314 tons in 1960/61.

Coke output, at 1,762,130 tons, was also slightly reduced during the financial year but was at a record level for a 52-week period year. Ironstone production reached a new peak at 5,678,776 tons, compared with the previous year's figure of 5,577,126 tons.

Production of ingot steel at the Appleby-Frodingham Steel Company, at 1,369,870 tons, was a record for a 52-week year and compared with 1,384,124 tons in the previous (53-week) year and 1,126,846 tons in 1958/59 (52 weeks).

Output of ingot steel at the other branches of the United Steel Companies during the year, with the figures for 1959/60 (53 weeks) and 1958/59 (52 weeks) in parentheses, were: Steel, Peech & Tozer, 1,106,925 (1,151,319; 928,072) tons; Samuel Fox & Company, Limited, 408,143 (424,487; 332,588) tons; Workington Iron & Steel Company, 299,298 (324,240; 209,366) tons.

Output of pig-iron by the Appleby-Frodingham Steel Company was also a record for a 52-week year at 1,465,260 tons, compared with 1,492,580 tons in the previous (53-week) year and 1,389,630 tons in 1958-59. Pig-iron production at the Workington Iron & Steel Company was 458,054 tons, compared with 515,514 tons in the previous year and 367,783 tons in 1958/59.

Coke production at Appleby-Frodingham, at 813,732 tons, was a record for any year, and compared with 769,930 tons and 664,365 tons in the two previous years. Output by the Workington Iron & Steel Company was 370,308 tons, compared with 399,983 tons and 341,532 tons in the two previous years, while United Coke & Chemicals Company produced 578,090 tons of coke compared with 597,190 tons and 584,606 tons in the two previous years.

Ironstone output by the ore mining branch of United Steel was a record for any year at 5,566,415 tons, compared with 5,456,269 tons and 5,085,482 tons in the two previous years, while production by the Workington Iron & Steel Company was 112,361 tons, compared with 120,857 tons and 121,900 tons previously.

Steel Output Down to 77 Per Cent. Capacity

STEEL production in September dropped by 17 per cent., compared with output for September, 1960, the Iron and Steel Board stated yesterday (Thursday). Although the weekly average rate in September recovered to 400,200 tons, compared with 338,400 tons a week in August, it represents the use of only 77 per cent. of capacity.

The board points out that the fall in steel production during the course of 1961 has followed broadly the same course as in 1958, the last year when activity in the industry declined. For the first three quarters of 1958 the percentage changes compared with 1957 were down by 1, 10, and 16 per cent., respectively. So far this year the quarterly changes have been down by 0.5, 2, and 14 per cent., respectively. As in 1958, the reduction appears to be caused largely by a reversal of the stock increase which took place in the previous year. In the third quarter of last year consumers' and merchants' stocks increased by 340,000 ingot tons, whereas in the third quarter of this year there are indications that stocks have been reduced substantially.

Latest pig-iron and steel output figures (in tons), with the corresponding 1960 returns, are shown in the following table:—

Period.	Pig-iron.		Steel ingots and castings.	
	Weekly average.	Annual rate.	Weekly average.	Annual rate.
1961—July.. ..	276,600	14,381,000	380,200	19,771,000
August ..	264,900	13,774,000	338,400	17,595,000
September ..	260,700	13,554,000	400,200	20,811,000
1st 9 months	292,500	15,211,000	436,700	22,706,000
1960—July.. ..	288,900	15,024,000	391,400	20,355,000
August ..	291,400	15,152,000	422,900	21,988,000
September ..	305,800	15,900,000	481,000	25,012,000
1st 9 months	300,000	15,611,000	461,300	23,987,000

Passing Thoughts . . .

LORD ROBENS

WAGES are the most sensitive point in industrial relations and yet they have been neglected to a degree. It is a very unusual thing for an employer to say "We must have a meeting with the union because it is time we gave them an advance in pay," and I have never come across any trade union organization which based its claim for an increase on any other basis than that of thinking of a number, doubling it, negotiating, and picking half of what you first thought of.—LORD ROBENS, chairman of the National Coal Board, speaking at the national conference of the Institute of Personnel Management.

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The best incentive for exports is a company's prospect of profit on such exports. There is a limit to which a company and its shareholders can be expected to serve the national interest of earning foreign exchange without due regard to the return on the capital employed by the company, and this is a matter which merits priority study by the Government at the present time.—MR. W. J. M. LONGMORE, leader of the Latin-American Division of the Western Hemisphere Exports Council at the Golden Jubilee export conference of the British Electrical and Allied Manufacturers' Association.

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Mr. T. Lloyd, the AEU divisional organizer, said the company had been informed that it was required to withdraw all blackleg labour by 2 p.m. yesterday (Thursday), and in the event of it not agreeing to do so, AEU members were instructed not to work with blackleg labour or carry out blackwork on the plant. "We are not interested in the bricklayers as such," he said, "but in the principle involved."

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Calling for a real effort to be made to provide a sensible approach to wages, Lord Robens said that the sensible thing to do was not to wait for wage applications at all. They ought to agree in industry that every year at a convenient day and time both sides should meet. "You sit down, you look at what the industry paid in the past year, you are able to say roughly what can be done in the following year. You can say: 'If we get this level of production, if we get these new machines which are now available, if we reorganize the way we do some jobs, if we can apply work study methods to industrial purposes, we can agree on next year's wages being upped by x per cent.'"

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Industrial Relations

Speaking of industrial relations, Lord Robens said that very often he sensed a feeling on the part of those responsible for negotiations that the success of what they were doing was based upon the victories they could secure over the other side. That was a mistaken approach; it was not the job of those responsible for negotiations to secure victories. It was to achieve by their skill the proper understanding of the problem and a common approach to it, whether it was a reorganization or a wage application.

On repetitive and uninteresting jobs—of which there were literally thousands in industry—Lord Robens suggested that one solution was teamwork to alleviate the boredom and loneliness. A co-operative team spirit could be beneficial to men, management, and the industry itself. He also favoured making it possible for men who worked in industry and who had something to give in the form of public service to be provided with the time necessary to perform public duties. "We ought not to worry too much that this is a cost on industry and means absence from work," he said.

Week-end School for Colliery Officials

WEEK-END school for colliery officials and staffs will be held at Whitley Bay (Northumberland) on October 21 and 22, by the National Union of Mineworkers. The speakers will include Lord Robens, chairman of the National Coal Board, and Mr. S. Watson, Durham Area secretary of the NUM.

Dr. W. Reid, chairman of the Durham Divisional Coal Board, will be one of the guests.

Pit Managers Urged to Give a Strong Lead

"THERE is no reason why any mine manager who has any guts about him at all, who is prepared to get on with his job, cannot lead his pit, with the highest technical knowledge that is obtainable, and the good human relations available today, far better than he could 40 years ago," said Mr. L. A. Clarke, deputy production manager, No. 2 (Doncaster) Area, North-Eastern Divisional Coal Board, speaking at Doncaster on Saturday.

He was replying to a question at a South Yorkshire mining Areas conference, organized by the Methodist Church. Mr. S. Keeton, a retired colliery worker, asked: "Comparing the mine manager before nationalization and now, is there any sense in which today he is frustrated and merely acting as a rubber stamp?" Mr. Clarke referred to the quick change under nationalization, from small unit management. He said that in any great undertaking, nationalized or not, a man must conform to the pattern and requirements of his board.

The aim of the conference was to make Methodism's influence for good in the mining communities more effective and vital. Similar meetings are planned for Lancashire, Northumberland, and other areas. Mr. H. L. Tolley, staff training officer of the Division, spoke on "Apprentice Training in the Mining Industry." Other speakers included Mr. Raymond Horbury, cashier and finance officer of the Yorkshire Area of the National Union of Mineworkers, the Rev. H. Maurice Hart, superintendent of the Methodist Doncaster District Coalfields Mission, and the Rev. William Gowland, warden of the Luton Industrial College, who presided.

Bigger Winter Coal Stocks in North-West

IN preparation for the winter, more than 300,000 tons of house coal have been stockpiled in the north-west. This figure, which excludes stocks held by merchants and factors, is a higher reserve than at the start of last winter. The North-Western Divisional Coal Board states that new stockpiling sites have been prepared near large centres of population.

More mechanized bagging plants are being brought into operation for the winter and amenties for delivery men, including showers and canteen facilities, have been improved.

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Industrial Relations

Speaking of industrial relations, Lord Robens said that very often he sensed a feeling on the part of those responsible for negotiations that the success of what they were doing was based upon the victories they could secure over the other side. That was a mistaken approach; it was not the job of those responsible for negotiations to secure victories. It was to achieve by their skill the proper understanding of the problem and a common approach to it, whether it was a reorganization or a wage application.

On repetitive and uninteresting jobs—of which there were literally thousands in industry—Lord Robens suggested that one solution was teamwork to alleviate the boredom and loneliness. A co-operative team spirit could be beneficial to men, management, and the industry itself. He also favoured making it possible for men who worked in industry and who had something to give in the form of public service to be provided with the time necessary to perform public duties. "We ought not to worry too much that this is a cost on industry and means absence from work," he said.

Week-end School for Colliery Officials

WEEK-END school for colliery officials and staffs will be held at Whitley Bay (Northumberland) on October 21 and 22, by the National Union of Mineworkers. The speakers will include Lord Robens, chairman of the National Coal Board, and Mr. S. Watson, Durham Area secretary of the NUM.

Dr. W. Reid, chairman of the Durham Divisional Coal Board, will be one of the guests.

Pit Managers Urged to Give a Strong Lead

"THERE is no reason why any mine manager who has any guts about him at all, who is prepared to get on with his job, cannot lead his pit, with the highest technical knowledge that is obtainable, and the good human relations available today, far better than he could 40 years ago," said Mr. L. A. Clarke, deputy production manager, No. 2 (Doncaster) Area, North-Eastern Divisional Coal Board, speaking at Doncaster on Saturday.

He was replying to a question at a South Yorkshire mining Areas conference, organized by the Methodist Church. Mr. S. Keeton, a retired colliery worker, asked: "Comparing the mine manager before nationalization and now, is there any sense in which today he is frustrated and merely acting as a rubber stamp?" Mr. Clarke referred to the quick change under nationalization, from small unit management. He said that in any great undertaking, nationalized or not, a man must conform to the pattern and requirements of his board.

The aim of the conference was to make Methodism's influence for good in the mining communities more effective and vital. Similar meetings are planned for Lancashire, Northumberland, and other areas. Mr. H. L. Tolley, staff training officer of the Division, spoke on "Apprentice Training in the Mining Industry." Other speakers included Mr. Raymond Horbury, cashier and finance officer of the Yorkshire Area of the National Union of Mineworkers, the Rev. H. Maurice Hart, superintendent of the Methodist Doncaster District Coalfields Mission, and the Rev. William Gowland, warden of the Luton Industrial College, who presided.

Bigger Winter Coal Stocks in North-West

IN preparation for the winter, more than 300,000 tons of house coal have been stockpiled in the north-west. This figure, which excludes stocks held by merchants and factors, is a higher reserve than at the start of last winter. The North-Western Divisional Coal Board states that new stockpiling sites have been prepared near large centres of population.

More mechanized bagging plants are being brought into operation for the winter and amenties for delivery men, including showers and canteen facilities, have been improved.

Personal

President-elect of IMM

MINING consultant to the Anglo-French Exploration Company, Limited, Mr. J. B. SIMPSON has been elected president of the Institution of Mining and Metallurgy for 1962-63. He was trained at the Camborne School of Mines from 1919 to 1922, and until 1928 was engaged in tin mining in Cornwall, Northern Nigeria and Bolivia. After nine years in South Indian and African goldfields, he served throughout the war—as CRE, 1st Tunnelling Group, Royal Engineers, from 1942 to 1945.

He was elected a member of IMM in 1944, served on its council from 1951 to 1958 and has been a vice-president since 1959. He is a governor of the Camborne School of Metalliferous Mining.

After 25 years as a field sales manager with the chemicals division trade sales department of Newton, Chambers & Company, Limited, Thorncliffe, near Sheffield, Mr. J. A. HAXTON has retired.

Mr. B. A. WILLIAMS, founder and president of Williams & Williams, Limited, makers of metal doors and windows, of Chester, has celebrated his golden wedding. Mr. and Mrs. Williams were married the year after he founded the company in 1910.

Mr. Robert D. HAIR, who has retired, joined Mitchell, Russell & Company, Limited, ironfounders, of Bonnybridge (Stirlingshire), as technical consultant in 1945. He has been closely associated with the development of buildings, machinery, and plant.

To commemorate 50 years as a director of John Webb & Company, Limited, brassfounders, of Birmingham, presentations have been made to Mr. TIMOTHY COLMAN. Now in his 79th year, Mr. Colman joined the board in 1911 and became chairman in 1922.

Mr. J. W. BUTLER, chairman, Associated British Machine Tool Makers, Limited, and the Butler Machine Tool Company, Limited, Halifax, has just started on a world tour which will include the USA, Japan, Hongkong, South-east Asia, India, and Pakistan.

Director of P. & W. Maclellan, Limited, for the last 13 years, Mr. JOHN PATON is, on medical advice, to retire. For 50 years he has been associated with the company's iron and steel departments. Mr. Paton will be succeeded by Mr. DAVID W. DUGUID, a director of the company.

The Minister of Power has appointed Mr. A. J. CLOUGH, chairman of Alfred Clough, Limited, Royal Art Pottery, Longton, Stoke-on-Trent; Mr. N. E. DENSEM, a divisional director of the Scottish division of United Glass, Limited, Bridge of Allan (Stirlingshire); and Mr. M. J. GLENNY, chairman of the Council of Ironfoundry Associations, to be members of the Industrial Coal Consumers' Council.

Deputy chairman of Lithgows, Limited, Port Glasgow, Mr. ALEXANDER H. WHITE was elected president of the Shipbuilding Conference at its annual meeting last week. Mr. ALLAN JAMES MARR, chairman and managing director of Sir James Laing & Sons, Limited, Sunderland, was elected vice-president. Mr. White succeeds Col. T. Eustace Smith, chairman and managing director of Smith's Dock Company, Limited.

Engineering director, Mr. R. S. MEDLOCK, and mechanical meter marketing executive, Mr. R. V. MAY, of George Kent, Limited, have left for South Africa and South America, respectively. Their missions are part of a policy of maintaining close personal liaison between parent company and oversea representation.

Sir Peter Roberts Heads Hadfields

FOLLOWING the resignation of Lord Dudley G. Gordon as chairman of Hadfields, Limited, steelmakers, of Sheffield, Sir Peter Roberts, MP, who became vice-chairman of the company earlier this year, has been appointed to succeed him.

SIR PETER ROBERTS

In April of this year it was announced that a group of nine industrial and financial companies was to provide over £2,600,000 of new capital for Hadfields. The group was headed by Sir Peter, chairman of the Wellman Smith Owen Engineering Corporation, Limited, and Newton, Chambers & Company, Limited, two members of the group which each provided about £400,000 under the scheme. Lord Dudley Gordon has agreed to remain on Hadfields' board as an ordinary director until the annual meeting, which is expected to be during February, after which it is his intention to retire as he approaches his 80th year.

It has been arranged that at the annual meeting he will present the usual chairman's statement and the accounts covering the final year of his office.

PINGON P. 200 IS LONDON'S TALLEST STATIC CRANE

TALLEST static tower crane in London is the Pingon P.200, now working at a height of 364 ft. on the Stag Brewery site, on which four multi-storey buildings are being erected in close proximity to each other. The largest, a skyscraper office block of 27 storeys (355 ft.) high, covers an area of 16,000 sq. ft. and will be the fifth tallest office block in London.

Sir Robert McAlpine & Sons, Limited, the contractors, wanted a crane that would service this immense structure through all stages of construction. The P.200 was the only available machine capable of giving the large capacities and coverage at the heights involved on a building of these dimensions. An additional section has been fitted to the standard P.200 jib to give an extended outreach of 164 ft. At this radius, loads of 2 ton 4 cwt. can be lifted. The maximum capacity is 15 tons at 30 ft. The P.200 is one of the range of Pingon tower cranes for which George Cohen Sons & Company, Limited, is the sole selling agent in this country.

A SIGN, 20 ft. by 14 ft., in the form of a permanently lit Union Jack with the words "Either Exports Go Up —Or Britain Goes Down" has been erected at the Baildon works of W. P. Butterfield, Limited, engineers and tank manufacturers. The Export Action Now committee of the Institute of Directors sponsored the erection of a similar sign in Piccadilly Circus and Butterfield's directors decided to support the effort by having a replica fitted at one of their factories. Official "switch-on" was on Monday.

If Britain Joins

IMPLICATIONS OF COMMON MARKET ENTRY

WHATEVER the terms of Britain's entry into the European Economic Community, they were unlikely to include permanent protection of British industry, said Mr. S. P. Chambers, chairman of Imperial Chemical Industries, Limited, addressing the conference of the Institute of Personnel Management in Edinburgh last Friday. He felt, however, that none of the problems connected with Britain's entry into the Common Market was insoluble, or that any likely expansion of trade with Commonwealth countries could be a substitute for European integration.

The big diversified industries such as ICI might gain on some products and lose on others. On balance, he believed that ICI would gain far more than it would lose. It was for other reasons, however, that entry into the Common market was likely to be of great long-term advantage to British industry as a whole, said Mr. Chambers.

MR. S. B. CHAMBERS

If the UK was to achieve a sound basis for her export trade, it was essential to reduce the dependence of exports on the sterling area countries, and other primary producing countries, which made up the slowest growing section of the world's markets, and to put herself into a position to meet competitors on level terms in the fastest growing market. He foresaw bitter controversy over this, but in the long run the life stream of British industry would be invigorated by the union with Common Market countries.

Feather-bedding Must End

"For too long," he said, "sections of British industry have been becoming increasingly insular, introspective, restrictive, reactionary, and inflexible. The protection of sections of industry which are obsolete and inefficient and ought therefore to be shut down so that the manpower, including management, is available for more progressive and developing industry, has been matched on the trade union side with restrictive practices, arising largely from the demarcation of one union from another, which has made it exceedingly difficult for some enterprises to adopt more efficient methods of production."

Mr. Chambers declared that free trade with continental Europe and freedom of movement for both capital and labour would remove much that was preventing productivity in this country from rising as it could.

On Thursday of last week the many implications of Britain's participation in the Common Market were examined by 200 leading industrialists and bankers and some 30 prominent industrial and financial experts representing each of the Common Market countries at a conference in Manchester arranged by a local firm of stockbrokers. A number of the oversea speakers made it quite clear that the Common Market was not just waiting for Britain to come in and skim the cream off the business obtainable. She would have to do her part in the difficult task of integration.

M. Jablon (France) reminded the conference that it was still early days in building up the European Community; there were no gifts or presents to be offered to newcomers—the only thing that could be offered was the opportunity to promote together, in a full team spirit, European integration and to realize as quickly as possible the Rome Treaty aims.

Only the really inefficient firms and the few confronted with competitors enjoying substantial natural advantages are likely to suffer seriously from British membership of the Common Market is one of the conclusions of a pamphlet, "If Britain Joins," published by the Economist Intelligence Unit, on Monday.

It reviews the prospects for eight leading industries. Iron and steel, it is believed, will profit from the increased exports and even more from the general boost in the demand for steel given by the overall expansion of UK economy which membership is likely to bring about.

Heavy electrical engineers will have to rationalize in the face of European competition at home and abroad. Specialization in machine tools should be increased. In the long run the result could be beneficial if British firms became more expansion conscious and based their capacity near peak demand, rather than on average demand.

Productivity Appeal by President of IPE

APPEAL for a "personal contribution" to the improvement of national productivity, which he describes as the key to the present economic difficulties of the UK, is made to the 13,000 members of the Institution of Production Engineers in a letter from the president, Mr. Harold Burke. He says that the Institution regards the present situation as a challenge, to be met by such remedies within its power, and it is intended to pursue this theme throughout the whole of 1962.

Points stressed by Mr. Burke for improved productivity are the regular examination of cost and methods of manufacture, keeping up-to-date in modern business trends, supporting local productivity associations, and giving support to local technical colleges or colleges of advanced technology, by encouraging members of staff to attend production engineering courses.

Board Changes

English Electric Subsidiary Changes

A NUMBER of changes in the boards of subsidiaries of the ENGLISH ELECTRIC COMPANY, LIMITED, are announced. Mr. George Nelson has been appointed chairman of Marconi's Wireless Telegraph Company, Limited, in succession to Lord Nelson of Stafford, who remains a director of the company. Sir Gordon Radley has been appointed deputy chairman.

LORD NELSON

Sir Gordon becomes chairman of English Electric Valve Company, Limited, and Mr. P. L. de Lazzlo, deputy chairman. Lord Nelson, Mr. Nelson, and Mr. P. Horsfall have retired from the board, and also that of Marconi Instruments, Limited, Sir Gordon Radley and Mr. F. N. Sutherland being appointed chairman and deputy chairman, respectively. Lord Nelson has retired from the board of the Marconi International Marine Communication Company, Limited, and is succeeded as chairman by Sir Gordon.

TECALEMIT, LIMITED—Mr. T. C. Worth has been appointed a director.

UNITED STEEL COMPANIES, LIMITED—Mr. H. Smith has been appointed a director.

OXLEY ENGINEERING COMPANY, LIMITED—Mr. Donald G. Stansfield has been appointed to the board.

BARROW HAEMATITE STEEL COMPANY, LIMITED—Capt. Georges E. Coles has resigned as chairman and from the board.

CHURCHILL GEAR MACHINES, LIMITED—Mr. C. R. Tearne, formerly technical sales manager, has been appointed a director.

NEWMAN, HENDER & COMPANY, LIMITED—Cmndr. A. B. Dickie and Mr. F. H. Stimson have been appointed assistant directors.

STEELE & COWLISHAW, LIMITED—Mr. J. A. W. Gill has been appointed to the board of the company, a subsidiary of Baker Perkins, Limited.

PETER BROTHERHOOD, LIMITED—Mr. W. Thompson (works manager) has been appointed to succeed Mr. A. Marcus Neal, who has resigned the chairmanship.

TIPPER INDUSTRIES, LIMITED—Mr. Phineas J. Stevens has ceased to be a director and also of the subsidiary, Stamford Engineering Company, Limited.

MORGAN CRUCIBLE COMPANY, LIMITED—Mr. J. F. King has been appointed a director. He is managing director of one of the company's subsidiaries, Morgan Refractories, Limited.

F. FRANCIS & SONS (HOLDINGS), LIMITED—Mr. G. R. F. Scotson has resigned from the board and also from the boards of the subsidiary companies of which he was director.

TURNER & NEWALL, LIMITED—Changes are announced in the boards of companies in the group. Mr. J. Waddell, executive director of Turner Bros. Asbestos Company, Limited, and Glass Fabrics, Limited, who has been appointed managing director of each, continues to be the executive director of J. W. Roberts, Limited. Mr. E. R. Pochin, home sales director of Ferodo, Limited, has been appointed managing director of that company, his former position being filled by Mr. M. H. Good, Ferodo's home sales manager.

HUMBER GRAVING DOCK & ENGINEERING COMPANY, LIMITED—Mr. A. D. Boyd and Mr. G. L. Hunter have been appointed to the board and Mr. J. R. Mackay has resigned his directorship.

COX & DANKS, LIMITED—Mr. H. Stewart has been appointed to the board. He joined the company, which is in the Metal Industries, Limited, group, as a salesman in the steel department in 1938.

ASSOCIATED ELECTRICAL INDUSTRIES, LIMITED—Mr. A. C. Main has been appointed director of manufacturing services. He remains as a non-executive director on the board of AEI (Manchester), Limited.

MILLER INSULATION & ENGINEERING COMPANY, LIMITED—Mr. W. B. Macmillan has been appointed managing director to succeed Mr. K. B. Miller, who has relinquished the position but remains on the board.

DU PONT COMPANY (UNITED KINGDOM), LIMITED—Mr. Samuel W. McCune III, deputy managing director, has been promoted to managing director, in succession to Mr. William H. McCoy, who returns to the US on special assignment with the parent company.

CYRIL ADAMS & COMPANY, LIMITED—Sir Ben Lockspeiser has been appointed to the board of the company, a member of the Staveley group. He is scientific adviser to the group and is on the board of Staveley Industries, Limited, the parent company.

TUBE INVESTMENTS, LIMITED—Sir Ivan A. R. Stedeford, chairman and managing director, has relinquished the latter office while continuing as executive chairman. Sir William Strath, Mr. W. Hackett, Jnr., and Mr. R. D. Young have been appointed managing directors of the group.

ASSOCIATED ENGINEERING, LIMITED—Mr. N. C. Brearley has resigned as deputy chairman, but remains a director of the company. Mr. J. E. L. Robinson has resigned from the board in order to take up an appointment with Associated Electrical Industries, Limited.

JESSOP-SAVILLE, LIMITED—Mr. F. A. Lytton, export manager, has been appointed a member of the local board and will continue to be responsible for the company's oversea connection as export sales director. Mr. A. H. Mills, sales manager of the subsidiary Jessop-Saville (Small Tools), Limited, becomes sales director of that company.

BRITISH INDUSTRIAL PLASTICS, LIMITED—Dr. W. Blakey has been appointed chairman of B.I.P. Chemicals, Limited, Mr. J. E. Beard, chairman of B.I.P. Reinforced Products, Streetly Manufacturing Company, Limited, and Hornflowa, Limited, and Mr. F. E. Mills, chairman of B.I.P. Engineering, Limited, and B.I.P. Tools, Limited. All are subsidiaries of BIP.

CAMMELL LAIRD & COMPANY, LIMITED—Sir Donald Perrott, K.B.E., has been elected to the board. Due to pressure of other business interests, Mr. P. B. Hunter has relinquished the chairmanship of the Cammell Laird subsidiary, the Patent Shaft Steel Works, Limited, and this position has now been assumed by Sir Donald Perrott. Mr. Hunter remains on the board.

C.K.S. GROUP UNITED METALS, LIMITED—Following the integration of the various companies in the group, Mr. C. Arthur Abrahams has been elected to the board of the parent company, and also to the C.K.S. Group, Limited, the main trading subsidiary. Mr. L. W. Smith becomes a director of the parent company and Mr. Stuart Young, chartered accountant, has resigned since his firm is one of the auditors of the C.K.S. Group.

FRENCH STEEL MARKET

Increase in Orders from Outside ECSC

[*From Our Special Correspondent*]

ORDERS registered by French steel mills during July and August were at about the same level as in the corresponding period of last year. The French home market generally maintained a satisfactory level, although there were some soft points as a result of destocking in certain steel-using industries. With the country's economic activity still rising, however, these weaknesses, which apply chiefly to the wire drawing, mechanical, and electrical industries, should disappear by the end of the year, when stocks are expected to reach their lowest level.

The metal fabrication sector is still expanding, resulting in a high demand for structural steel. Agricultural machinery is continuing the improvement which it began to show some months ago, and although activity in the automobile industry has been well below last year's level, the increasing registration of new cars gives reason to believe that prospects in this field shou'd improve.

Total orders from countries in the European Coal and Steel Community showed no substantial change compared with July-August, 1960, although there was a weakening of demand from Germany.

Financing Development Plan

Demand from non-ECSC countries, however, proved strong and orders registered were about 6 per cent. above the level in the corresponding period last year. These orders have entailed some sacrifices by way of prices, mainly for wire rod, concrete reinforcing bars, and plate. Prices of sheet, however, showed some firmness, substantial orders arriving from Switzerland, the USA, and the Argentine.

Though home prices of French steel appear still to be inadequate to provide their normal share in the financing of investments, no general rise is expected in the near future beyond the recent increase of prices of special alloys—an increase which was mainly to take account of the rise in prices of non-ferrous alloy metals.

The industry's financing corporation, Groupement Des Industries Sidérurgiques (GIS), has announced the issue of a loan of NF 450.000.000 in 5 per cent. bonds. The loan, which is the biggest ever issued by a private French industry, is designed to finance the steel industry's expansion programme under the fourth French development plan. The target was set at 25.000.000 tons by 1965, compared with the present French steel output of about 18.000.000 tons. A highlight of the programme is the building of a new modern sheet steel rolling unit.

Total outlay under the fourth development plan is estimated at NF 12.000.000.000, if various charges, including debt redemption and working capital are added to the NF 9.000.000.000 for equipment proper. It equals that of all the outlays involved in the past 16 years under successive plans.

The industry is deriving confidence from its uninterrupted steady growth in past years, from the present level of activity and from the prospect of further increases of domestic consumption, which while absorbing 70 per cent. of production is still lower per head compared with the American, British, or German.

Leaders in the industry, however, are not happy about the blocking of the prices of its products by the Government. These low prices may help it to be the leading exporter in France and to compete with its rivals abroad, but they do not ensure the level of profits considered desirable owing to the industry's heavy indebtedness and need for heavy investment. Its debts are calculated still at 45 per cent. of turnover, though they have declined from the 65 per cent. of 1954.

If the target of capacity for 1965 is reached, France will still have only a half and three quarters, respectively, of the prospective German and British capacities.

Rhodesia to Expand Iron and Steel Industry

IT is understood that Sir Edgar Whitehead's statement to the United Federal Party congress in Salisbury (S. Rhodesia), on Thursday of last week about the Southern Rhodesian Government's negotiations "on a staggering scale" for the expansion of the iron and steel industry, referred to iron-ore deposits in the Buhwa area, 30 miles south-east of Shabani. The deposits are only two miles from the railway line to Lourenço Marques and near the isolated railway siding of Ingezi.

Sir Edgar told the congress that the investment involved was greater than any enterprise he had ever handled. Meanwhile, Consolidated Goldfields of South Africa, Limited, is exploring a new coalfield 70 miles east of Beit Bridge on the Limpopo river. A shaft is being sunk and the main coal seam should be reached within the next month. The development is proceeding although the demand for thermal power is lower because of the advent of Kariba hydro-electric power and although the Rhodesian railways need less coal now that diesel locomotives are in greater use.

The new coalfields are expected to yield good coking coal ideal for smelting purposes, and the deposits are also within easy reach of the Lourenço Marques railway.

FOUR SHEFFIELD FIRMS—Newton, Chambers & Company, Limited, Ward & Payne, Limited, George Wostenholm & Sons, Limited, and Walker & Hall, Limited—will be represented in Sweden at the Council of Industrial Design's special display in Stockholm from October 18 to November 12.

Standard Boardroom Practice

FOR some time the Institute of Directors has felt that there is much misunderstanding of the true functions of the director. He has responsibilities to the shareholders, the employees, customers, and creditors, as well as to his fellow directors. Standard Boardroom Practice, published recently by the Institute of Directors, does not set out to lay down a code of ethics for directors, but rather points to the standards of conduct at which directors should aim.

Throughout the book upholds the standard that in any conflict of conscience—an appeal for dividend restraint, for instance—the good director puts his responsibility to his company before his duty to the State and if that maxim does not find favour in all quarters it is certainly provocative.

Two quotations that serve to give an idea of the style of Standard Boardroom Practice are:—"The reputation of being 'a good firm to work for' should be one of the most prized assets of any company"; and "In private companies particularly a curious split mentality is sometimes found to exist; men who would be horrified at the suggestion they should help themselves to the petty cash quite cheerfully draw money for expenditure which cannot possibly be construed, in the deathless words of the Inland Revenue maxim, as 'wholly, exclusively, and necessarily' incurred in the performance of their duties."

The book is the result of many months' discussion by a special committee the members of which were Sir Edwin Herbert (chairman), a director of many companies and a former president of the Law Society; Mr. John Corbett; Sir Nutcombe Hume; Mr. Harald Peake, chairman of the Steel Company of Wales, Limited, and chairman-designate of Lloyds Bank, Limited; Mr. Alfred Read, a director of Powell Duffryn, Limited, British Briquettes, Limited, and Rhymney Engineering Company, Limited; Sir Halford Reddish, chairman and managing director of the Rugby Portland Cement Company, Limited, and a director of Alfred Herbert, Limited, and other companies; Mr. J. H. Thomson, a director of Ferranti, Limited; the late Lord Weeks, former chairman of Vickers, Limited, and of the Finance Corporation for Industry; and Mr. F. W. Willis.

Gloucester Wagon Company to End Railway Work

ONE of the first companies to start making railway wagons more than 100 years ago, the Gloucester Railway Carriage & Wagon Company, Limited, is to stop making railway rolling stock on the completion of existing contracts. The company incurred a group net loss of £303,789 in the year ended May 31 (compared with a previous net profit of £143,403), and passed the dividend.

General Sir William Morgan, the chairman, says that discussions are going on with Winget, Limited, engineers and ironfounders, of Rochester (Kent), and it is hoped that an extension of an arrangement with this firm may provide an additional volume of work sufficient to make an appreciable impact on available facilities.

LAKE & ELLIOT, LIMITED—Mr. H. S. Garnick has been appointed an additional director.

Special Train for Sheffield Works Visit

BY special train (with cinema coach), some 80 bankers, brokers, officials from foreign embassies, and city editors, travelled from London to Sheffield on Thursday of last week for a visit to the Darnall Works of Davy & United Engineering Company, Limited, a subsidiary of Davy-Ashmore, Limited. Film shows en route stressed the essential place of steel in the world and Sheffield's capabilities in the production of special steels and in engineering.

The party was met at the works by Mr. M. A. Fiennes, chairman and group managing director of Davy-Ashmore, and Mr. M. F. Dowling, managing director of the host company. At a conference after the works had been seen, Mr. Fiennes said that he had no fears of Britain's entry into the Common Market, given the basis of a common economic foundation (Germany bearing its share of defence) and social benefits throughout the countries being demonstrably the same.

He agreed that some 70 per cent. of the machine tools at the works were of foreign manufacture, but this, he said, stemmed from the group's policy of giving their workpeople—and their trainees—the best machines available. A delegation from the machine-tool industry had been to the works and had been told why the firm bought from abroad. As a result the industry was making a very serious effort to do something about it and certain developments could be expected.

DEWRANCE APPOINTS NEW CHAIRMAN

DEPUTY chairman of Dewrance & Company, Limited, manufacturers of boiler mountings, pipeline, valves, etc., of London, S.E.1, Sir Donald Perrott is to become chairman of the company, a subsidiary of Babcock & Wilcox, Limited. He will succeed Sir Eric Mieville, who is retiring from that position. Sir Francis Evans is also retiring from the board.

Mr. J. B. W. Cunningham has been appointed managing director and will take up his duties in January next year, when he will resign as managing director of the engineering group of the UK Atomic Energy Authority. Mr. H. V. Disney, at present deputy managing director of the Authority, will succeed Mr. Cunningham. He will have the title of managing director (designate) from November 1.

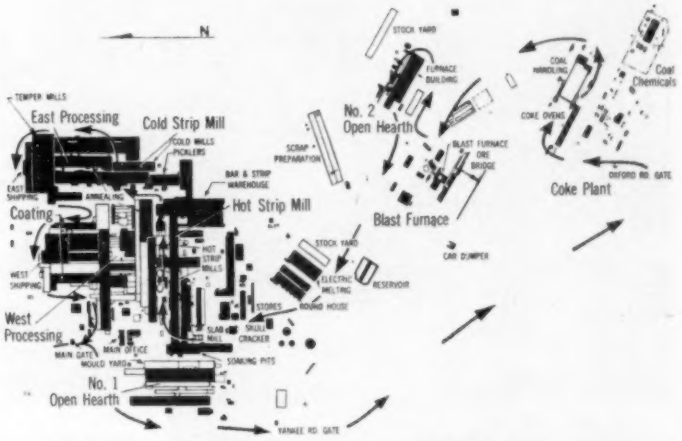
Science in General Management

UNTIL recently head of operation research and cybernetics for United Steel Companies, Limited, Sheffield, Mr. Stafford Beer is to lead the activities of Science in General Management, Limited (SIGMA), an Anglo-French organization of scientists. SIGMA has been formed to advice business, industry, and the Government, on their problems.

Speaking at the launching of the venture last week, Mr. Stafford Beer said that in Britain, even after 20 years, many exercises in operation research were distinguished by a lack of intention or the necessary drive to do anything with the answers.

ISI Special Meeting in the USA and Canada

MIDDLETOWN WORKS of ARMCO STEEL CORPORATION



The Middletown Works of the Armco Steel Corporation.

As part of the special meeting of the Iron and Steel Institute to be held in the United States and Canada this month and next a visit will be made to the Middletown Works of the Armco Steel Corporation. Taken together, the units of Armco Steel have a steelmaking capacity of about 6,500,000 ingot tons. The 95 plants of the corporation have a total of over 40,000 employees and 70,000 shareholders. The corporation is divided into two steelmaking divisions, the Armco Division in the highly industrialized east central areas and the Sheffield Division in the mid-west and south-west.

THERE are four major subsidiaries, whose manufacturing and sales operations complement the basic steelmaking divisions. These are the National Supply Company, Armco Drainage & Metal Products, Inc., Armco International Corporation, and the Union Wire Rope Corporation. Armco also owns several smaller subsidiaries and has financial interests in a number of raw material suppliers and transport companies.

In steel research Armco justifiably claims a special place. It established over 50 years ago the first laboratory in the steel industry devoted exclusively to research. Notable among the many "dividends" of the corporation's vigorous research policy are Armco enamelling iron, Armco electrical sheet, and the special Armco precipitation-hardening stainless steels now being used for high-speed aircraft and missiles.

Research is carried out in all sections of the corporation though the main research is done in the research laboratories at Middletown, a notable building sheathed in enamelled Armco iron sheets. This, however, is proving insufficient for modern requirements and a much larger research centre is now under construction. This is expected to be ready by the end of the year.

The Middletown Works

The fully integrated steelmaking plant at Middletown, Ohio, is the largest of the six plants in the Armco Division, which, together, have a total of six blast furnaces, 28 open-hearth furnaces, and nine electric furnaces, and a capacity of 4,250,000 tons of steel a year.

This works, located on the east side of Middletown, processes a large inflow of raw materials —iron ore, coal, limestone, scrap—to a wide variety of steel products; hot-rolled sheet, cold-rolled sheet, enamelling iron sheet, electrical sheet, stainless sheet, and aluminium-coated, zinc-coated, and lead-coated sheet. Its pig-iron requirements are supplemented by the Armco Hamilton plant 13 miles to the south-west, which has a coking plant and two blast furnaces.

Coke Plant.—The Middletown battery has 76 ovens of regenerative type, each holding 182 tons of coal (Fig. 1). The coking cycle is 18 hr. and the daily coke make about 1,300 tons. The

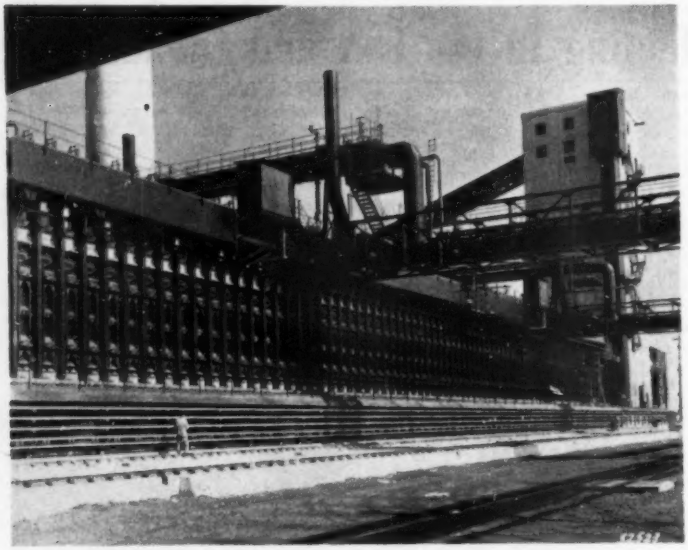


Fig. 1.—Battery of coke ovens at Armco's Middletown Works.

by-product plant produces tar, ammonium sulphate, light oil, and coke-oven gas. Further refined by fractionation, the light oil yields benzol, toluol, xylol, and intermediate light oil.

Blast Furnaces.—One large furnace (Fig. 2). This furnace, which started operation in 1953, has a hearth diameter of 28 ft. and a height of 106 ft. 6 in. It averages 1,852 tons of iron a day.

Open-hearth.—Eight 180-ton fixed furnaces at No. 1 shop and six 290-ton fixed furnaces at No. 2 shop. No. 1 shop uses about 60 per cent. and No. 2 shop about 50 per cent. hot metal. The fuels used are oil, tar, and coke-oven and natural

Electric Furnaces.—Two 100-ton arc furnaces of shell diameter 20 ft. and bath depth of 38 in. (Fig. 3).

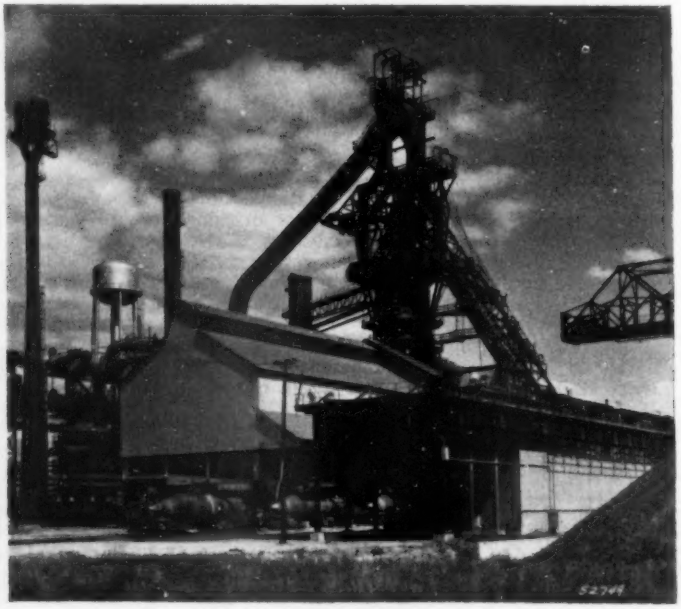


Fig. 2.—The Middletown blast furnace, with ladle cars in the foreground.

Soaking Pits and Slab Mill.—Fourteen rows, totalling 68 soaking pits (32 regenerative and 36 recuperative), heat the ingots, which range from 22 in. thick and 30 in. wide to 22 in. thick and 57 in. wide, and 6 to 11 tons in weight.

The slabbing mill, comprised of a two-high mill (Fig. 4) with rolls 45 in. by 120 in. and an edging mill, with vertical rolls of 40 in. by 26 in., has a capacity of 250 ton/hr. A hot scarfer, having a series of oxy-acetylene burners, conditions slab surfaces and is equipped with turnover table for scarfing both sides of the slabs.

Slab Furnaces.—There are four slab furnaces: they are of Armco design, built by Salem-Brosius, and fired with natural gas or fuel oil, with possibility of conversion to coke-oven gas firing. Each furnace will take slabs up to 26 ft. in length and will hold four slabs of average width. Average heating time is 25 min./slab.

Roughing Mill.—This reduces slabs of 4 in. to 6 in. in thickness to thicknesses ranging from ½ in. to 1 in. It consists of six mills, three being two-high (rolls 34 in. and 44 in. dia. by 80 in. wide) and three being four-high mills (rolls 21 in., 36 in., 46 in., and 54 in. dia. by 80 in. wide).

Hot-strip Mill.—This consists of six four-high mill stands with rolls of 23 in. and 49 in. dia. and 80 in. width. This mill train reduces material from the roughing mill (½ in. to 1 in. thick) to 0.10 in. thick, the speed of exit from the last stand being about 28 m.p.h.

Picklers.—The descaling equipment consists of three units, each composed of a scale breaker, welder, loop pit, and acid and rinse tanks. The speed of processing is up to 250 ft./min.

Cold-reduction Mill.—There are two cold mills. No. 1 is a three stand four-high mill with rolls of 19 in. and 50 in. dia. by 80 in. wide. It rolls strip at speeds up to 1,500 ft./min. The maximum width it can roll is 72 in. and the minimum final thickness 0.030 in.

The No. 2 mill (Fig. 5) is a four-stand four-high mill with rolls of 18½ in. and 49 in. dia. by 54 in.

Fig. 3.—A 100-ton electric arc furnace being tapped.

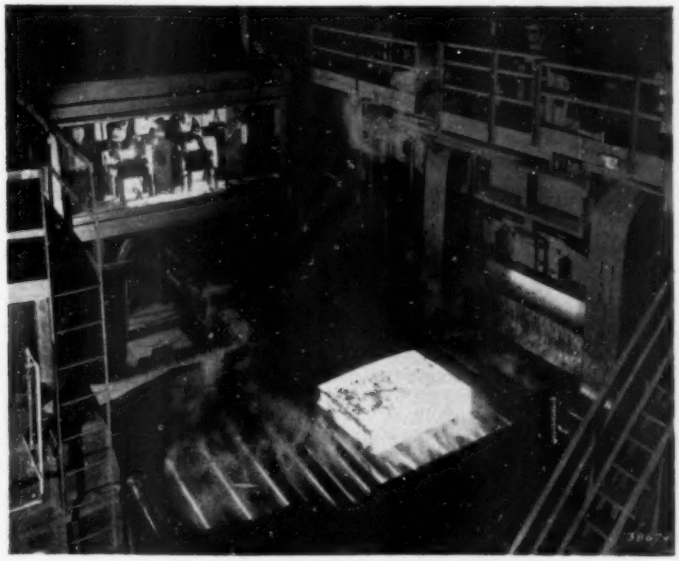


Fig. 4.—An ingot being rolled through the slab mill. The control room is shown at the left background.

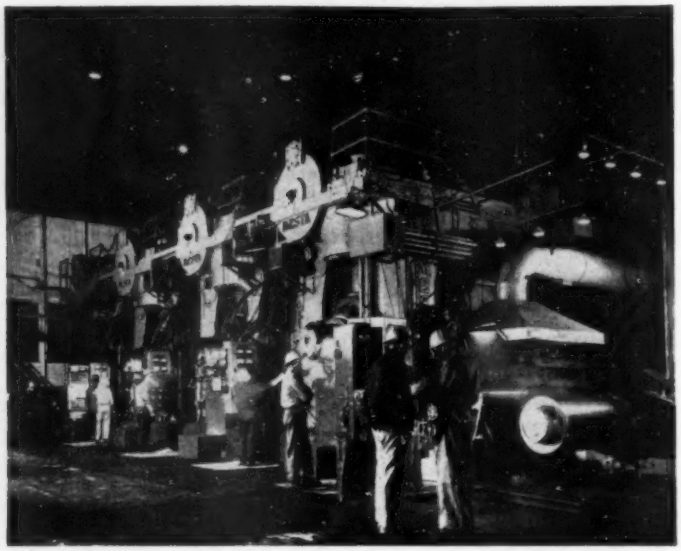


Fig. 5.—Steel coil being reduced through the No. 2 cold rolling mill.

wide. The maximum width it can roll is 50 in. and the minimum final thickness is 0.015 in. Rolling speeds are up to 2,200 ft./min.

Annealing and Normalizing.—The heat-treating equipment includes a variety of batch and continuous-type furnaces. Some are open-flame type and others closed-box type with protective atmospheres to prevent scale formation. Annealing is done in both coil and sheet form. Batch box annealing is done in lots of up to 100 tons with cycle times of up to several days. In continuous normalizing strip is heated and cooled in a matter of minutes.

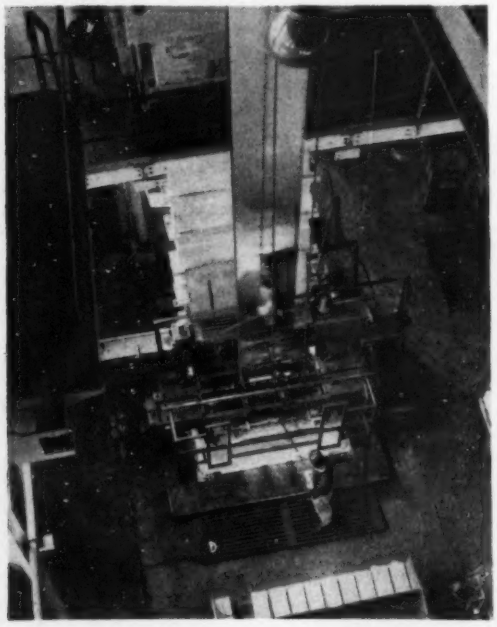


Fig. 6.—Bird's-eye view of steel emerging from a zinc-coating machine.

Temper Rolling.—This is done on either two-high or four-high mills and on either sheet or coiled material.

Zinc Coating.—Trade named "Zincgrip," sheet is coated in two Sendzimir-type lines by passing the coil first into an oxidizing atmosphere to clean, then to a 400-ft. long reducing and heat-treating furnace having a controlled atmosphere. From this the strip passes through a pot of molten zinc and emerges vertically for air cooling (Fig. 6). The product is a tight coat that will withstand drawing without damage.

Lead Coating.—There is a coil terne coating unit for the production of lead-coated strip and a sheet terne coating unit for processing sheets, speed ranges being from 18 to 62 ft./min. and 18 to 40 ft./min., respectively.

THE JAPANESE FIRM Kawasaki Rolling-Stock Manufacturing Company is seeking to install a plant for the construction and repair of railway wagons in the Province of Buenos Aires.

AKERS STYCKEBRUK, Sweden, has entered into a contract with Shin-Nippon-Koki, Limited, belonging to the Yawata concern, under which the Japanese firm will manufacture pipes by means of centrifugal casting machines on an Akers' Patent. Akers Styckebruk has also entered into an agreement with the Indian firm, Prakash Engineering & Rolling Mills, Limited, for the manufacture of centrifugally cast pipes in India on a royalty basis. The Indian firm is being equipped with Swedish-built machinery.

Control of

SPONTANEOUS COMBUSTION IN MINES

Development of a Latex Sealant

The development and application of a sealant to prevent and control spontaneous combustion in mines was the subject of a paper, of which extracts are given here, by Mr. R. R. Stapleton, development manager—Latex, Dunlop Chemical Products Division. The paper was given at the 1961 Mines Rescue Superintendents' Conference on May 11, at the Birch Coppice Colliery Training Centre, No. 4 (Warwickshire) Area, West Midlands Divisional Coal Board.

SPONTANEOUS heating of coal can be a worrying and costly problem, and at times can be a very real hazard in underground mining operations. The cause of the problem is quite simple; wherever mining operations are being carried out, material of one sort or another is removed and an air space is left. Under the immense pressure which exists at the depths at which minerals are mined there is a tendency for solid matter to be pushed into these spaces. This means that the surrounding areas begin to crack and at some stage small passages exist through which air can be forced by normal pit ventilation.

When these passages are in coal the air causes oxidation and if the quantities of air going through them are not sufficient to keep the temperature down then spontaneous heating can develop. This is an over-simplification of the phenomenon, but, in general, for a heating to develop, there must be a small, but continuous, flow of air through broken coal and the more finely broken is the coal, then the greater is the danger of a heating arising. Some types of coal are more susceptible to heating than others and many factors play their part, but south Staffordshire and Warwickshire, where thick coal seams are being worked, are areas in which heatings are, unfortunately, all too prevalent.

Preventing the Flow of Air

There is no means of preventing the natural tendency of a coal to heat and the only alternative is to prevent the flow of air. It was with this problem, and the idea of applying a sealant to areas affected by spontaneous combustion, that an approach was made to Dunlop Chemical Products Division by Mr. G. S. Milne, deputy Area production manager (operations), No. 4 (Warwickshire) Area, West Midlands Divisional Coal Board.

It was stipulated that the sealant must be:—Non-inflammable both during and after application; it must be non-toxic at all stages; should be as inexpensive as possible; it must perform the sealing operation in one operation and be applied rapidly and readily by spraying; it would have to be capable of being stored ready for an emergency, but then dry out quickly after application; while still wet it would have to stay where it was applied and adhere tenaciously when dry; it must dry out to give a film of sufficient elasticity to withstand settlement and strata movement and yet the film must be sufficiently strong and resistant to abrasion; and above all, it must be impervious to the passage of gases when both wet and dry and when once applied must remain effective for long periods.

The original idea was to have something similar to the "cocoon" preservation of warships and other armaments; indeed, the term "cocoon spraying" was used for some time. However, cocoon spraying proper involves the use of highly inflammable organic solvents which could not be used in a mine. This meant that a latex had to be used to prepare the sealant. A latex is a colloidal dispersion of rubber in water; latices either occur naturally and are obtained by tapping rubber trees or they can be manufactured synthetically by a method known as emulsion polymerization.

The latex which was chosen was that of polychloroprene, which has good film forming properties and by virtue of its chemical nature is non-inflammable. The development work on the sealant included long-term storage and accelerated ageing tests and the latex was compounded with such things as stabilizers, antioxidants, and acid accepters until the desired properties were obtained. A search was then begun for the required physical properties and the spraying characteristics. All

this took some time, but eventually the day arrived when practical tests could be applied underground.

Testing and Use of the Sealant

The first trial involved the difficult treatment of an advanced heating in the goaf of a longwall working. The face at Colliery A was an old retreating hand-loaded working which was within a few days of being exhausted. A good thickness of coal was present and was being worked by 6-ft. 6-in thick Slate and Ryder faces. Throughout its life the face had been liable to heating which in general occurred in the first waste near the tension end of the face belt.

During the summer holiday period of 1959 the pit was to be on auxiliary winding, while the main winding gear was to be overhauled and a limit of 15 persons to be allowed underground was set. Routine examination had shown signs of a heating in the Ryder goaf for 14 days and in the normal course of events it would have been impossible with so few people covering the whole pit to give this one face the attention it needed to ensure that it could be worked after the holidays.

Instead of completely sealing the district a sandbag wall was built from pack to pack in front of the wastes and the sealant was applied to this wall for the whole of the 100-yd. length of the face.

Fig. 1 shows the site of the heating and the area which was to be treated.

Labour was scarce in the few days before the holiday and the preparations which were specified had not been undertaken. Instead of the props and the conveyor belt being moved forward they remained in their previous positions; between the pack wall and the conveyor there was a 2-ft. depth of spillage and the end of the roof bars pierced the bag wall leaving a triangular-shaped gap between each pair of props which proved to be inaccessible for plugging. In addition, the roof was in rather a poor state; there were several large breaks and at one point there had been a small fall leaving a cavity extending about 10 ft. into the shale roof. None of these had been filled up.

After two days it became obvious from carbon monoxide determinations that the heating was continuing. Stoppings were built across the face, but eventually stoppings were constructed in the airways leading to the face. Although this initial trial proved unsuccessful, much valuable information was obtained and it was decided never to use the sealant again without proper preparation. A few tons of coal were lost, but these were doomed in any case, and it was agreed that the lessons learned were cheap at the price.

The next problem which was tackled was at Colliery B where a district had been sealed off, again due to a heating in the Ryder waste. Short stoppings had been applied at the face without much effect and final stoppings had to be constructed in the intake and return airways. Although the heating was contained, the results were not completely successful. This was thought to be due to air passing through and around the stoppings and then through the roof into old workings 40 ft. above. There was a good sandbag face on each of the stoppings and the roadways themselves were lined with boards between the arches. A seal was applied and the stopping at once became effective.

It is interesting to note that samples of the applied film taken from this stopping more than 18 months ago show no sign of deterioration. Since the incident the district has been completely quiet and a seam immediately above the one sealed off is being opened up and worked.

The next heating which was dealt with at Colliery C had a particularly high nuisance value as it occurred in a locomotive roadway where at one point the road ran through a thin inclined coal seam. The road had been back ripped and, consequently, a little of the coal had fallen and breaks had occurred. Fig. 2 shows the basic details of the incident. The spot eventually started to show signs of heating and the concrete slabs between the arches became too hot to touch. The heating was dug out, the cavity packed with sand, and the surface coated with latex. The treatment proved successful and no further trouble has been experienced.

Sealing Under Emergency Conditions

The stage had now been reached when a material had been developed which had the right handling characteristics and with proper preparation was completely effective. The results that had been obtained were from underground work and it was thought necessary to carry out practical tests on the surface under controlled scientific conditions. Preparations for these were put in hand, but before a start could be made a further opportunity arose to use the seal under emergency conditions.

Fire had broken out at Colliery D some 300 to 400 yd. inside a district about a mile from the pit

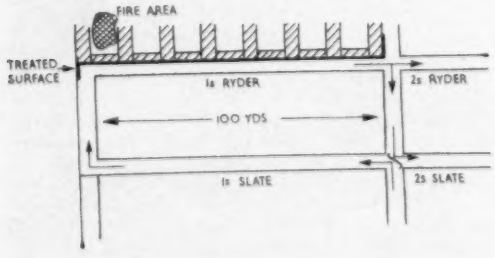


FIG. 1.—INITIAL SEALING TRIAL AT COLLIERY A AT 1S RYDER RETREATNG FACE.

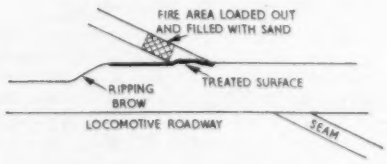


FIG. 2.—SECTION OF LOCOMOTIVE ROADWAY AT COLLIERY C AFFECTED BY SPONTANEOUS COMBUSTION.

bottom. Despite grave difficulties, stoppings had been erected in the intake and return airways, but not before a prefabricated aircrossing for the district had been badly damaged; only its dual underpass remained serviceable. Ten days after the incident the entire pit was closed and it was imperative that it should be opened again as soon as possible. Inspection showed that this was not possible for, although the fire was now quiescent, the air flowing past the No. 2 District was being polluted with carbon monoxide which the fire was still making at the rate of 40 cu. ft./min. and some of this was coming through the stoppings, which had been built in great haste and were not as airtight as was desired.

The make of carbon monoxide was being passed around the adjacent No. 3 District and two steps were taken to remedy the situation. Ventilation canvas was erected to direct air across the stoppings and into the underpass, while the two stoppings were sprayed with the sealant (Fig. 3). As a result of the success of the operation it was possible to reopen all but the affected district allowing production at the pit to be resumed. Unfortunately, the air at the point where 2s and 3s returns met had not been continuously sampled for carbon monoxide, but it is known that the methane content at the face of the stoppings was considerably reduced.

Trials Under Controlled Conditions

This emergency dealt with it was now possible to return to the trials which had already been considered. For these a training gallery, 7 ft. by 9 ft., driven some 95 yd. through a dirt mound, was used. In the gallery a pressure chamber (Fig. 4) was built so that a fan could exert an air pressure of 2 in. water gauge on the face of a ventilation stopping built of brattice cloth nailed onto a framework of 2-in. by 2-in. timber.

Airflow through the stopping was measured and the sealant was then sprayed on the face of the stopping and continued back in the pressure chamber until all the crevices of the lining of the roadway were sealed and the passage of air into the loose shale of the pit mound stopped.

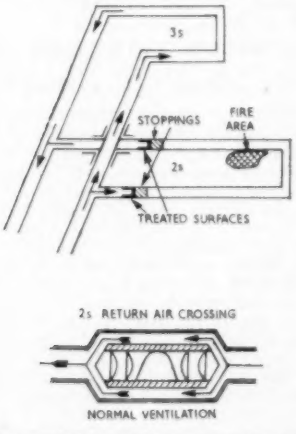


FIG. 3.—INCREASING THE EFFECTIVENESS OF STOPPINGS AT COLLIERY D FOLLOWING A FIRE IN 2S DISTRICT.

FIG. 5.—AEROGRAPH-DEVILBISS TYPE UB-1 SPRAYING EQUIPMENT, COMPRISING A 10-GAL. PRESSURE FEED TANK, A SPRAY GUN WITH ADAPTOR, A 15-FT. LENGTH OF 1-IN. BORE FLUID HOSE AND CONNECTIONS, A 15-FT. LENGTH OF $\frac{5}{16}$-IN. AIR HOSE AND CONNECTIONS, AND A 30-FT. LENGTH OF $\frac{3}{16}$-IN. AIR HOSE AND CONNECTIONS.

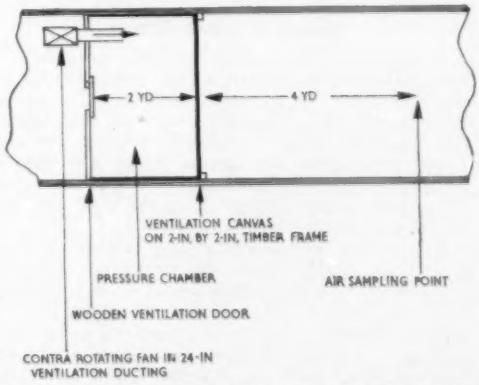


FIG. 4.—AIRLOCK BUILT IN A 7-FT. BY 9-FT. GALLERY DRIVEN IN A DIRT MOUND FOR SCIENTIFIC TRIALS.

It was now not possible to measure the flow of air through the stopping by normal means, so the air in the roadway beyond the stopping was sampled and carbon dioxide introduced into the pressure chamber. Air sampling beyond the stopping continued for 45 min. The results of the analysis on the samples taken showed that the airflow through the stopping had been reduced from 1,360 cu. ft./min. to between 5 and 10 cu. ft./min.

Samples of the sealing film were removed three months later for physical testing. These had been continuously soaked by water seepage through the dirt mound, but, nevertheless, the film had good tensile properties and showed no sign of deterioration.

Determinations have also been made using the high-pressure equipment for testing tyre inner tubes and the amount of air which can be forced through a perfect film is so small that, if it were part of a stopping ¼ in. thick under a pressure of 3 in. water gauge, only 1 cu. ft. of air would pass through a stopping 26,000,000 sq. ft. in area.

The equipment, shown in Fig. 5, used to apply the film is the same as that used to apply car underbody sealant. An air pressure of 60 to 80 lb./sq. in. is recommended and it is advisable to fit a relief valve set at 80 lb./sq. in. There are two spray guns available, having a ¼-in. and ⅜-in. jets, respectively. The larger size gives the best results and is less prone to blockage by solid material which might be accidentally introduced to the spray pot. At 60 to 80 lb./sq. in. with a ⅜-in. gun an air flow of rather less than 50 cu. ft./min. will be required.

The time taken for the sealant to set will depend on the thickness that has been applied and such other factors as temperature and humidity and the quantity of air flowing past the seal. On the surface the sealant applied to sandbags is touch-dry in about an hour, but underground in humid still conditions it may take up to 24 hr.

The liquid sealant can be stored without deterioration for months if necessary, but it must be remembered that it is a latex compound and should be stored indoors at a reasonable temperature.

Future of Latex Sealing

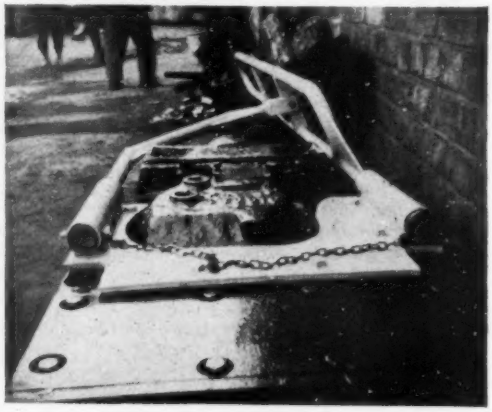
Most of the work that has been described has been in connection with safety underground and the treatment of heatings which have already broken out. It is thought, however, that hazards can greatly be reduced by timely treatment of areas which experience has shown might well develop heatings if left to themselves. Work of this nature is currently being undertaken in the West Midlands Division of the National Coal Board.

In addition, there are many places where working conditions could greatly be improved and costs much reduced if ventilation could be improved and it is suggested that the method of sealing that has been developed could be of assistance in this connection. Leakage through ventilation doors, surface airlocks, and aircrossings, which are often troublesome can be prevented by an application of the sealant.

Guard for Coal-cutting Machine Operator

TO prevent risk of injury to a man working behind a longwall coal-cutting machine, Mr. P. Blunt, of the National Coal Board's East Midlands Division, has designed a guard. This apparatus offers complete safety in conditions where it is impracticable to sprag the falling coals.

The apparatus consists of a curved tubular metal frame which is fitted onto an anchor plate bolted



GUARD TO PREVENT RISK OF INJURY TO A MAN WORKING BEHIND A COAL-CUTTING MACHINE.

to the gearhead of the coal-cutting machine and which is braced by a supporting bracket mounted on the anchor plate.

The guard is of simple construction and is easy to fit, and can be made to suit any seam section.

REMOTE CONTROL OF HYDRAULIC CHOCKS

REMOTE control system of operation to prevent the risk of accident when operating Gullick six-legged hydraulic chocks has been devised by Mr. R. Mills, of the National Coal Board's East Midlands Division.

In using the system it is possible to lower, advance, and reset the support from an adjacent support, hence eliminating any risks involved when carrying out the operation from underneath the support. The system does not require any additional valve gear; all that is required additionally is a hose and distributing block inserted in each chock circuit. Each chock leg is coupled to one of the ports in the distributing block and a hose taken from this block to the operating valve gear on the adjacent chock. All the chocks are connected in this way so that the operation of any chock is made possible by using the valve gear on the adjacent chock.

The operation of any one chock is thus obtained from an adjacent chock, which provides the necessary safety for the operator.

Coal Mining in South Africa

Survey of Current Production

Origin, growth, and the future exploitation of the South African coal deposits were described by Dr. P. N. Lategan, chairman of the Transvaal Coal Owners' Association, to members of the seventh annual Commonwealth Mining and Metallurgical Congress in Johannesburg. His description, of which extracts are given here, appeared in the April 21 issue of the South African Mining and Engineering Journal.

MAJOR coalfields of the Union of South Africa, in order of the maturity of the coal, are Northern Orange Free State (Vereeniging), Springs/Heidelburg, Emelo/Breyten, Witbank/Middelburg, and Northern Natal. In the first two areas, two to three seams are found which may attain thicknesses in places of up to 60 ft.; the coal, being of low rank, is inclined to weather and its heating value is comparatively low.

Because of these characteristics, the coal is seldom carried over long distances or stored for any length of time.

Importance of the Breyten/Middleburg Coalfield

In the Breyten/Middleburg coalfield up to five main seams occur, but they are rarely all present and of the same quality in any locality. Consequently, only one, and seldom more than two, seams are worked. This is the most important coalfield in South Africa by reason of its quality, tonnage produced, and available reserves. Most of the coal produced is used entirely for combustion purposes, while only sections of other seams are utilized as a blend in coke production and, to a small extent, in the manufacture of town gas.

In addition to being used as a household coal, the production from Northern Orange Free State and the Springs/Heidelburg coalfields is principally consumed in large power stations situated at the collieries, thus eliminating the cost of transport.

The Natal coalfields have the most mature coal in the Union. It is customary to divide these fields into the Vryheid-Paulpietersburg coalfield and the Kliprivier coalfield. In the former are present some five seams, of which only two or three are mined in any one locality, while in the latter two seams occur, both of which are generally mined.

The Natal coalfields have suffered considerably from erosion and the effects of igneous intrusions and, in consequence, reserves are limited. This is unfortunate because they are the source from which the iron and steel industry draws coking coal, which is blended with high-volatile, weak-coking Witbank coal. Blending is resorted to to conserve the limited reserves which are confined to two collieries in Natal. From these fields is also produced anthracite or semi-anthracite formed by the heat of igneous intrusions.

A number of other coalfields are known to be present in the Northern Transvaal, which, unfavourably situated by reason of transport facilities and distance from large areas of consumption, are not exploited. It is believed, however, that these reserves could yield a suitable blend of coking coal by selective mining and careful washing.

Enough Coal for 2,000 Years

The reserves of coal in the Union of South Africa at the present rate of consumption of 40,000,000 tons per year are large enough to last for 2,000 years. The Union not only has coal in abundance, but also the cheapest coal in the world. But producers and consumers are faced with the fact that coal comparable with the best European types cannot be produced.

Coal is cheap, primarily because the coal seams are thick and are bedded horizontally at shallow depths. The average thickness of the seam worked in the Witbank area, for example, is about 10 ft. and a working thickness of 18 ft. is not uncommon. In the Vereeniging area, where present extraction varies from 7 ft. to 14 ft., up to 50 ft. of coal has been extracted.

The seams mined in the Witbank area range in depth between about 150 ft. and 350 ft. Because of the relatively shallow overburden, inclined shafts are used and the coal is generally brought to the surface by conveyor belt. Pillar-and-stall mining, eliminating the use of expensive roof supports, is adopted. The output per manshift for conventional mining is about 3.5 tons and for mechanized mining between 7 and 11 tons.

The scale of operations varies from coalfield to coalfield. In the Orange Free State there are six collieries with an average annual output of about 2,000,000 tons. One of these collieries supplies SASOL, and the others supply large power stations situated on, or in close proximity to, the pitheads. In the Transvaal there are seven collieries with

(Cont. overleaf, foot of col. 1)

Anti-breakage Boom Loader

DIFFICULTY has been experienced in loading coal into wagons from a boom loader, particularly in its lowest position. Normally, it is not possible to provide a chute at the end of the boom loader, because the steepness of the angle would result in breakage. To overcome this problem an anti-breakage chute has been designed in the National Coal Board's East Midlands Division by Mr. W. J. Pearson, unit mechanical engineer at Ollerton Colliery, and Mr. J. H. Revill, senior draughtsman at Area headquarters. Their chute, shown in Fig. 1, is designed to maintain a constant delivery angle under any position of the loading boom.

The loading chute (1) is pivoted on the jib drumshaft (2), thus allowing the chute to rotate about the drum centre line. This is held at the required angle by tie rods (4) connected to arms (5) on the jib fulcrum bracket (6) which, in turn, are anchored to the conveyor structure by adjustable tie rods (7). The horizontal centres of the tie rods (4) must correspond with the jib centres, and the vertical centres on the arms (5) with the vertical centres on the chute side plates (3). Altering the angle of the chute is done by adjusting the back tie rods (7). Where the belt tensioning gear is mounted at the jib end, it can be compensated for by adjusting the tie rods (4).

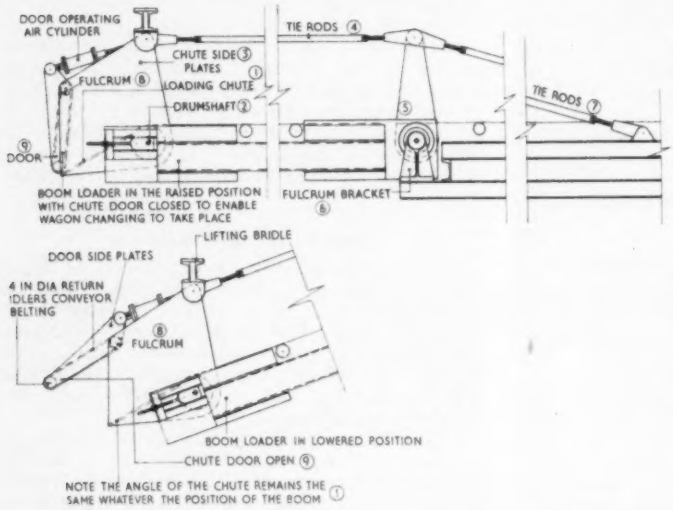

DOOR OPERATING AIR CYLINDER
TIE RODS ④
CHUTE SIDE PLATES ③
FULCRUM ⑧
LOADING CHUTE ①
DRUMSHAFT ②
TIE RODS ⑦
⑤
⑨ DOOR
BOOM LOADER IN THE RAISED POSITION WITH CHUTE DOOR CLOSED TO ENABLE WAGON CHANGING TO TAKE PLACE
FULCRUM BRACKET ⑥
LIFTING BRIDLE
DOOR SIDE PLATES
4 IN DIA RETURN IDLERS CONVEYOR BELTING
⑧ FULCRUM
BOOM LOADER IN LOWERED POSITION
CHUTE DOOR OPEN ⑨
NOTE THE ANGLE OF THE CHUTE REMAINS THE SAME WHATEVER THE POSITION OF THE BOOM ①

FIG. 1.—ARRANGEMENT OF LOADING BOOM INCORPORATING ANTI-BREAKAGE CHUTE.

As the jib is raised or lowered into the wagon the arms (5) on the fulcrum bracket (6) are maintained in their predetermined position by the tie rods (7). Since the length of the tie rods (4) and the drum centres on the conveyor boom are of equal length, the axis line on the chute side plates, between the tie rod end and drum centre, must remain parallel to the arm (5). As the latter is fixed, the chute and its delivery plate will remain at the same angle whatever the movement of the boom.

The device can be modified for use as a wagon changing hopper by extending the chute side plates to form hopper sides. Mounted on a fulcrum (8) is a compressed-air operated door (9) which can be closed to retain material in the chute until the loading boom is lowered into the bottom of an empty wagon.

COAL MINING IN SOUTH AFRICA

(Cont. from previous page)

annual outputs of over 1,000,000 tons, 11 with outputs of over 500,000 tons, and nine with outputs of less than 500,000 but more than 100,000 tons.

Coal mining in Natal is on a smaller scale. Apart from six small anthracite producers with a total output of less than 500,000 tons per year, there are only seven collieries each producing more than 500,000 tons of bituminous coal per year. The remaining seven pits each produce much less than 500,000 tons per year.

The output of 40,000,000 tons of coal by South African collieries is divided among consumers as follows:—Generation of electricity, 39 per cent.; industries and domestic, 21 per cent.; railways, 18 per cent.; carbonization and gasification, 15 per cent.; mining, 6 per cent.; and exports and bunkers, 1 per cent. This analysis of coal utilization indicates the importance coal has played and is playing in the development of the country's basic industries, secondary undertakings, and transport.

"Directory of Branded Hardware"

The 1961 edition of the "Directory of Branded Hardware" is a completely revised edition of previous issues. It now contains over 40,000 names, including all the new branded lines introduced since the 1960 edition was published. It thus forms a dependable current register of named products in hardware and ironmongery, builders' and plumbers' goods, paints, metals, tools, engineers' supplies, electrical goods, etc. The directory is published by the Ironmonger and is available from the Publisher, Branded Hardware, 28, Essex Street, London, W.C.2, price 10s. (postage 1s. 9d. extra).

The production of fine-grained steels is a subject of vital interest to the steelmaker. A review of the literature indicates that a fine grain size can be consistently obtained by introducing more than 0.015 per cent. Al into the steel. In this article a short description of the chemistry of aluminium in steelmaking is given to explain the possible causes of aluminium loss. Samples and relevant data on grain-controlled steels were collected from various steel plants in order to compare the effects of various methods and amounts of aluminium addition employed for grain size control. The data indicate that mould and trumpet additions are the most effective means of introducing aluminium into the steel. A ladle addition, however, is the most common practice, and will give satisfactory grain control with proper precautions. The need to incorporate more than 0.015 per cent. Al in the steel to obtain fine grain size consistently is confirmed. Analysis for aluminium content as a basis for evaluating grain size is recommended. The author, who was with BISRA when this study was made, is now with the steel processes division of Davy-Ashmore, Limited.

ALUMINIUM CONTENT OF STEEL AS A MEASURE OF GRAIN SIZE

by S. C. DESAI, B.Sc.(Met.Eng.), A.I.M.

THE influence of the austenitic grain size of a steel on its properties is well established and has led to an increased demand for grain-controlled steels in the engineering industry. Aluminium, zirconium, titanium, and vanadium are elements known to be used for grain control, aluminium being the most usual addition.

Although the mechanism is not fully understood, the control addition inhibits grain growth by raising the grain coarsening temperature of the steel. The relationship between residual aluminium and the grain coarsening temperature has been shown by Washburn[1] (Fig. 1). His observations are further confirmed by Halley,[2] who carried out grain coarsening tests on steels with varying aluminium additions, the results of which are given in Table 1.

The results given in Table 1 show that the grain coarsening temperature increases with increasing aluminium content up to about 0.04 per cent. aluminium, any increase beyond which tends to coarsen the grain.

TABLE 1.—*Grain Coarsening Test on SAE 1030 Steel Deoxidized with Aluminium.*

Aluminium addition, lb. per ton.	Acid sol. Al, per cent.	Al_2O_3 per cent.	Grain coarsening temperature—8 hrs. heating.
None	0.000	0.001	815–940
0.25	0.001	0.008	840–955
0.50	0.009	0.008	925–945
1.00	0.038	0.008	950–970
2.00	0.073	0.010	895–995
4.00	0.169	0.008	840–980

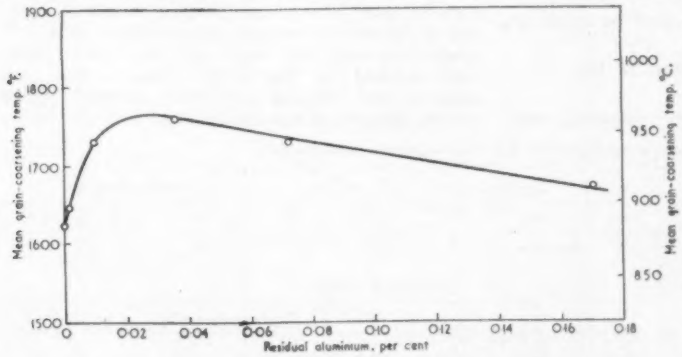


FIG. 1.—EFFECT OF RESIDUAL ALUMINIUM ON THE GRAIN-COARSENING TEMPERATURE OF SAE 1030 STEEL. HOLDING TIME AT TEMPERATURE, 4 HR. (WASHBURN).

Washburn[1] carried out a statistical study on a number of heats of steels to which aluminium had been added. These steels were subjected to the McQuaid-Ehn test, and the total aluminium contents were determined. The heats were graded according to their aluminium contents, as shown in Table 2.

A similar statistical analysis of 961 electric furnace heats by Ressler[3] is given in Table 3.

TABLE 2.—*Relation of Total Aluminium Content to McQuaid-Ehn Grain Size.*

Group.	No. of tests in group.	Total aluminium, per cent.	Fine grain tests (5–8), per cent.
A	7	Under 0.005	14
B	68	0.005–0.010	29
C	42	0.010–0.014	52
D	58	0.015–0.030	100

Table 3 indicates that:—

(*a*) All heats containing aluminium in excess of 0.015 per cent. are fine grained (McQuaid-Ehn No. 5 or finer).

(*b*) In the aluminium range 0.011 to 0.015 per cent., the grain size still remains fine, with a trend to the coarser side of the fine grain range.

(*c*) In the aluminium range 0.006 to 0.010 per cent., the grain coarsening is pronounced at 925 deg. C (the McQuaid-Ehn test temperature).

(*d*) In the aluminium range nil to 0.005 per cent., all the heats coarsen at 925 deg. C.

These results show that aluminium contents in excess of 0.015 per cent. are necessary to produce fine-grained steels consistently. A general survey of practices at various works has shown that amounts varying from 1 lb. to 3 lb. of aluminium per ton of steel, equivalent to 0.045 per cent. to 0.13 per cent., are added to produce fine-grained steel. In spite of these additions being considerably higher than the 0.015 per cent. residual aluminium necessary to obtain satisfactory grain control, the steelmaker is often troubled by inconsistent grain size.

Commercial aluminium is available in various forms. It can be obtained in the form of pellets, sticks, plates, "dough-nuts," or alloys with high aluminium content.

The practice for adding aluminium differs from works to works. Additions are made in one or more of the following ways:—To the furnace, to the stream of metal in the launder, to the ladle, to the trumpet, to the mould.

The purpose of the present investigation was to study the practices adopted by different works, the methods of addition and amounts of aluminium added, the efficiency of utilization, and the resulting grain size of the steel produced.

CHEMISTRY OF ALUMINIUM IN STEELMAKING

Aluminium added to steel will dissolve and remain as such, combine with other elements dissolved in iron, or react with non-metallic inclusions.

Aluminium in Solution

Aluminium and iron can combine to form compounds Fe_2Al_3 and $FeAl_3$, but with low concentrations of aluminium (which are of interest here), the aluminium dissolves in liquid iron and remains in solid solution on cooling.

Combination of Aluminium with Other Elements

Aluminium can combine with carbon to form aluminium carbide (Al_4C_3) and with sulphur to form aluminium sulphide (Al_2S_3), but the thermodynamic data indicate that combination with carbon or sulphur does not take place under steelmaking conditions at the concentrations normally encountered. Aluminium can combine with nitrogen to form aluminium nitride. Analysis of a number of steel samples has shown that aluminium present as aluminium nitride constitutes only a small proportion of the added aluminium. However, any aluminium nitride, carbide, and sulphide will be decomposed during normal analytical procedures, and the contained aluminium will be analysed as soluble.

Combination of Aluminium with Oxygen

The reaction with oxygen or oxides constitutes the main source of loss of added aluminium. Aluminium is the strongest deoxidizer in general use and Fig. 2, taken from Chipman,[4] shows the relationship between residual aluminium and oxygen contents in iron at three temperatures.

Fig. 3 shows the comparative deoxidizing efficiencies of silicon, manganese, carbon, and aluminium. The immense superiority of aluminium over other deoxidants is clearly seen. In all cases where aluminium is to be added for grain control, a thorough preliminary deoxidation is carried out by ferro-silicon and ferro-manganese additions. This reduces the oxygen of the steel to the level shown in Fig. 4. Even so, when the aluminium addition is made, some of it is consumed in further deoxidation of the steel to oxygen contents shown in Fig. 2. Aluminium may also react with any oxide inclusions present in the steel. These oxides are reduced, and alumina (Al_2O_3) is formed, which may be retained in the steel or may float out.

TABLE 3.—*Relation of Spectrochemical Aluminium to McQuaid-Ehn Grain Size.*

	Fine grain size.						Coarse grain size.		
McQuaid-Ehn grain size	8	7/8	6/8	6/7	5/8	5/7	4/7	3/7	3/6
Number of heats	537	277	133	5	2	1	2	1	3
Aluminium, per cent.	Percentage of heats.								
0.000—0.005	—	—	—	—	—	—	—	—	66.7
0.006—0.010	0.2	0.7	4.5	20.0	—	100.0	100.0	100.0	33.3
0.011—0.015	2.8	7.6	18.0	40.0	—	—	—	—	—
0.016—0.035	83.6	75.1	64.0	40.0	100.0	—	—	—	—
0.036—0.040	8.4	8.3	8.3	—	—	—	—	—	—
0.041—0.045	3.2	3.6	2.3	—	—	—	—	—	—
0.046—0.060	1.8	4.7	2.9	—	—	—	—	—	—

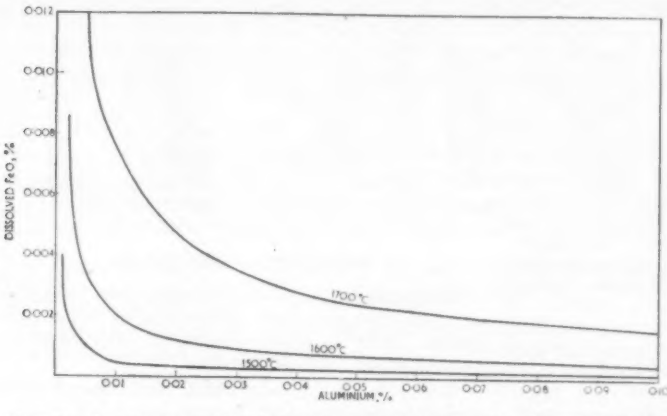


FIG. 2.—RELATIONSHIP BETWEEN ALUMINIUM ADDED FOR DEOXIDATION AND IRON OXIDE DISSOLVED IN THE BATH (CHIPMAN).

Causes of Aluminium Loss

If all the aluminium added were to be distributed as AlN, Al_4C_3, Al_2S_3, soluble Al, and as secondary deoxidation products this would amount to complete utilization of the addition. But, in practice, this is not found to be the case. The amount of aluminium retained by the steel varies considerably, the losses being due to some of the following causes:—

1.—Aluminium, due to its low specific gravity, floats on the surface, becomes oxidized, and is lost in the slag.

2.—If the preliminary deoxidation with ferro-silicon and ferro-manganese is not thoroughly carried out, more aluminium is necessary for secondary deoxidation.

3.—If sufficient time is not allowed for the products of the preliminary deoxidation to separate from the steel, rising particles are likely to be reduced by aluminium.

4.—Oxidation of the metal stream while tapping and teeming may consume some aluminium for further deoxidation.

5.—There is always some slag tapped with the steel, and aluminium has a marked tendency to react with it.

PRESENT WORK

From the indications of aluminium loss, it can be seen that the method of addition and the stage at which the aluminium is added can greatly influence the efficiency of its utilization for grain-size control. The practices employed by different works vary widely. The present work was carried out to survey the practices employed at various works and the degree of grain control obtained. It was also

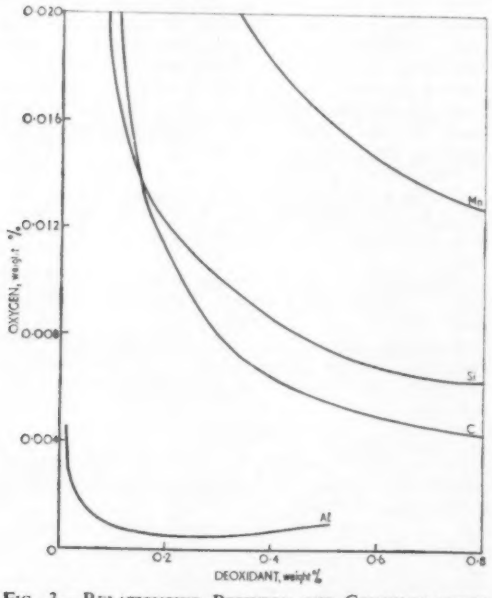


FIG. 3.—RELATIONSHIP BETWEEN THE CONCENTRATIONS OF DEOXIDANTS IN SOLUTION IN LIQUID IRON AT 1,600 DEG. C. (TURKDOGAN).

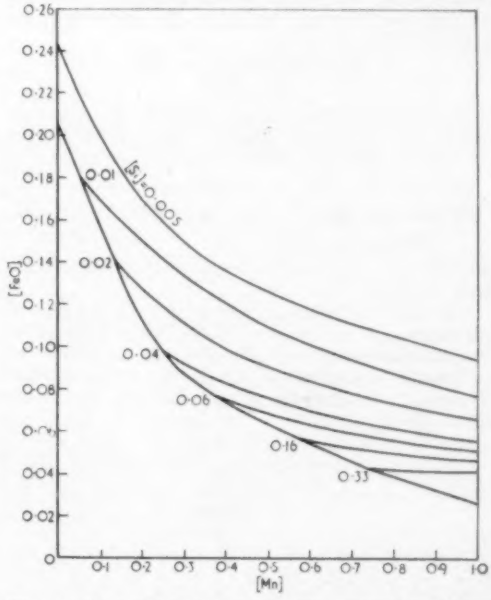


FIG. 4.—EQUILIBRIUM DIAGRAM FOR DEOXIDATION WITH BOTH MANGANESE AND SILICON FOR 1,627 DEG. C. (SCHENCK AND BRUGGEMANN).

TABLE 4.—*Works A—Basic Electric Process* (0.20 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Per cent. Al recovery.	Grain size.
En 351	4	0.15–0.17	22.4	0.015–0.022	24–35	5–8
En 353	6	0.15–0.17	22.4	0.011–0.042	16–67	6–7
En 354	1	0.15	22.4	0.020	32	8
En 355	1	0.15	24	0.040	61.2	8
En 355	4	0.15–0.18	22.4	0.016–0.033	25–55	6–8
SAE 8620	3	0.20–0.21	22.4	0.014–0.032	22–39	6–8
S 92	1	0.21	22.4	0.019	30	7–6
			Mean:—	0.023	37.2	

designed to show the amount of aluminium that is usefully employed to fulfil the primary aim of the addition, *i.e.*, grain-size control.

It was decided to examine steels at two levels of carbon content. Accordingly, McQuaid-Ehn test samples of grain controlled steels with carbon contents of about 0.2 per cent. (0.15 per cent. –0.25 per cent.) and 0.4 per cent. (0.35 per cent. –0.45 per cent.), made by basic open-hearth, acid open-hearth, and electric arc processes were obtained from various works. Relevant data of the method and amount of aluminium additions and grain size (McQuaid-Ehn test) were collected. The samples were analysed spectrographically to determine the aluminium content.

From the collected data, the percentage recovery of aluminium was calculated as follows:—

$$\text{Per cent. aluminium recovery} = \frac{\text{Total aluminium} \times 100}{\text{Aluminium added}}$$

(where total aluminium is the aluminium content of the steel sample obtained by spectrographic analysis)

$$= \frac{Al_{sol} + Al_{Al_2O_3} \times 100}{\text{Al added}}$$

It would have been more desirable if, instead of aluminium recovery, figures for efficiency of aluminium addition could have been obtained:—

$$\text{Per cent. efficiency of aluminium addition} = \frac{\text{Useful aluminium} \times 100}{\text{Aluminium added}} = \frac{Al_{sol} + Al_{deox} \times 100}{\text{Al added}}$$

(where Al_{deox} is the aluminium used for secondary deoxidation).

This would also have given a better indication of the degree of deoxidation of the metal bath prior to aluminium addition. But this was considered to be beyond the scope of the work, as no reliable method of determining oxygen content of steel is yet available.

PRACTICES AND DATA

Six works which produce considerable quantities of grain controlled steels participated in this investigation. They produce grain controlled steels by various processes as follows:—

Works A—Basic electric arc, basic open-hearth, acid open-hearth.
Works B—Basic electric arc, basic open-hearth.
Works C—Basic electric arc, basic open-hearth.
Works D—Basic electric arc, acid open-hearth.
Works E—Basic electric arc.
Works F—Basic electric arc.

A short description of the practice at each works, the collected data about the samples, the aluminium contents, and percentage recoveries follow. To make comparisons easier, the observations are classified according to the steelmaking process.

Basic Electric Arc Process
Works A

The steelmaking practice is to slag off after the boil. Ferro-silicon is then added to the bath. A white slag is made with lime, fluorspar, and coal dust. Finishings (FeMn, pig-iron, FeCr, Ni, etc.) are added as required. Final additions of ferro-silicon are made to bring the steel up to the specified composition. While tapping, the slag is held back in the launder. Aluminium additions are made to the ladle in stick form.

The data on samples are given in Tables 4 and 5.

Chemical analysis, En 355 sample: Soluble Al, 0.022 per cent.; insoluble Al, 0.0059 per cent.; nitrogen, 0.0135 per cent.; spectrographic Al, 0.033 per cent.

Aluminium content range, 0.015 to 0.04 per cent. Aluminium recovery range, 20 to 65 per cent. Grain size, uniformly fine.

Remarks: For a 0.06 per cent. aluminium addition an average recovery of 0.023 per cent. is obtained. The grain size is consistently uniform and fine.

TABLE 5.—*Works A—Basic Electric Process* (0.40 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.
En 19	6	0.40	24	0.013–0.034	19–50	5–7
En 19	14	0.35–0.44	22.4	0.018–0.045	28–70	6–8
En 19	2	0.40–0.44	20.8	0.021–0.034	32–56	7–8
En 19	1	0.43	25.6	0.036	50	7
En 24	2	0.40–0.45	22.4	0.016–0.025	25–40	7–8
Ni-Cr-Mo	1	0.44	22.4	0.032	51	7
			Mean:—	0.024	40.5	

TABLE 6.—*Works B—Basic Electric Process* (0.20 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.
En 34	19	0.17–0.25	28	0.024–0.055	30–70	5–8
En 34	2	0.23–0.24	26	0.032–0.043	33–60	5–8
			Mean:—	0.034	43.8	

Chemical analysis, En 19 sample: Soluble Al, 0.018 per cent.; insoluble Al, 0.0029 per cent.; nitrogen, 0.0121 per cent.; spectrographic Al, 0.025 per cent.

Aluminium content range, 0.013 to 0.045 per cent. Aluminium recovery range, 20 to 60 per cent. Grain size, uniformly fine.

Remarks: An average recovery of 0.024 per cent. is obtained with uniform fine grain size.

Works B

The slag is removed after the boil, and 4 oz./ton of aluminium is added in the form of a cake (made by pouring liquid steel over the aluminium sticks in a small mould). Additions are made for the finishing slag and the bath is killed with ferro-silicon. The launder is bridged to hold back the slag, and 24 oz./ton of aluminium in stick form is thrown into the stream when the ladle is approximately one-sixth full.

The collected data on samples are given in Table 6.

Chemical analysis, En 34 sample: Soluble Al, 0.025 per cent.; insoluble Al, 0.0076 per cent.; Nitrogen, 0.0111 per cent.; spectrographic Al, 0.035 per cent.

Aluminium content range, 0.024 to 0.05 per cent. Aluminium recovery range, 33 to 60 per cent. Grain size, uniformly fine.

Remarks: With a 0.08 per cent. aluminium addition, an average recovery of 44 per cent. is obtained. Grain size is uniformly fine.

Works C

Aluminium addition is made in two stages. Prior to tapping, 4-6 oz./ton of aluminium in stick form tied to a bar is rabbled into the bath of steel. A second addition of 16 oz./ton is made to the ladle by plunging the aluminium, in "dough-nut" form, suspended on three arms of a special jig by means of an auxiliary crane, into the steel when the ladle is about one third full. This method of aluminium addition is ingenious. As the steel level rises in the ladle aluminium is gradually consumed. The aluminium "dough-nuts" on the arms of the jig are held in position by the buoyancy of aluminium in steel.

The collected data on samples are given in Table 7.

Chemical analyses (per cent.):—

	Sol. Al.	Insol. Al.	Nitrogen.	Spectrographic Al.
*Tim 375 sample ..	0.0055	0.0046	0.009	0.01
†EN 34 sample ..	0.0056	0.0053	0.0124	0.01
‡EN 34 sample ..	0.016	0.0061	0.0105	0.024

TABLE 7.—*Works C—Basic Electric Process* (0.20 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton	Total Al, per cent.	Percentage Al recovery.	Grain size.
Tim 375	6	0.19–0.20	22	0.010–0.024	16–38	6–8
Tim 375*	1	0.19	22	0.01	16.3	80 per cent. 1–3 20 per cent. 6–7
Rover 4615	4	0.19–0.21	20	0.012–0.018	21–32	7–8
Rover 4618	1	0.21	20	0.019	34	7–8
En 34‡	4	0.16–0.18	20	0.012–0.024	21–43	7–8
En 34†	1	0.17	20	0.01	16.3	30 per cent. 1–3 70 per cent. 6–8
En 35A	4	0.16–0.23	20	0.013–0.016	23–29	7–8
			Mean:—	0.016	27.2	

Aluminium content range, 0.01 to 0.025 per cent. Alumininum recovery range, 15 to 40 per cent. Grain size, mostly fine with a few casts of mixed grain.

Remarks: There is a tendency to produce occasional casts of mixed grain size. The total aluminium content of the mixed grain samples is less than 0.01 per cent. It should be noted, however, that for a 0.20 per cent. C steel only 20 oz./ton of aluminium are added.

Works D

After boil and slag off, ferro-silicon is added. When the ferro-silicon is completely dissolved, 3 oz./ton of aluminium are added in stick form to the bath. A white slag is then made with limestone, fluorspar, crushed anthracite, and ferro-silicon. Necessary additions are made to bring

TABLE 8.—*Works D—Basic Electric Process* (0.20 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.
SAE 8620	6	0.19–0.23	27	0.018–0.054	23–71	6–7
			Mean:—	0.036	46.9	

TABLE 9.—*Works D—Basic Electric Process* (0.40 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.
En 18C	15	0.34–0.40	27	0.016–0.088	21–110	5–7
En 18	3	0.36–0.37	27	0.017–0.052	22–68	4–6
En 18B	10	0.34–0.38	27	0.017–0.065	22–85	6–7
			Mean:—	0.034	44.2	

the steel up to the specification, and, finally, more ferro-silicon is added. Aluminium is added in pellet form to the launder, precautions being taken to prevent tapping of slag with the metal. Small amounts of aluminium in pellet form are added to the moulds.

The collected data on samples are given in Tables 8 and 9.

Chemical analysis, SAE 8620 sample:—Soluble Al, 0.025 per cent.; insoluble Al, 0.0051 per cent.; nitrogen, 0.011 per cent.; spectrographic Al, 0.038 per cent.

Aluminium content range, 0.02 to 0.55 per cent. Alumininum recovery range, 25 to 70 per cent. Grain size, uniformly fine.

Remarks: Average recovery of aluminium is 47 per cent. and a uniformly fine grain is obtained.

Chemical analyses (per cent.):—

	Sol. Al.	Insol. Al.	Nitrogen.	Spectrographic Al.
En 18C sample ..	0.025	0.0043	0.0041	0.041
En 18B sample ..	0.017	0.0063	0.0074	0.026

Aluminium content range, 0.015 to 0.06 per cent. Aluminium recovery range, 20 to 85 per cent. Grain size, uniformly fine.

One ingot out of four is tested for grain size, samples being taken from the mid-axis of a billet, 2 to 5 in. square, corresponding to the top and bottom part of the ingot.

Ferro-vanadium containing 50 to 55 per cent. vanadium is added in the furnace a few minutes before tapping. A vanadium addition of 0.075 per cent. gives a very uniform grain size.

Collected data on samples is given in Tables 10 and 11.

Chemical analyses (per cent.):—

	Sol. Al.	Insol. Al.	Nitrogen.	Spectrograph c Al or V.
Sample with Al ..	0.025	0.0045	0.0109	0.040 Al
Sample with V ..	0.0015	0.0013	0.0084	0.072 V

Content range, 0.015 to 0.05 per cent. for Al; 0.077 to 0.098 per cent. for V. Recovery range, 30 to 115 per cent. for Al; 90 to 130 per cent. for V. Grain size, uniformly fine.

Remarks: A uniformly fine grain size is obtained at this works by the addition of aluminium to the trumpet or by the addition of ferro-vanadium in the furnace. The high aluminium contents could be due to non-uniform distribution, as the additions are made to the trumpet. Vanadium

TABLE 10.—*Works E—Basic Electric Process* (0.20 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Addition, oz./ton.	Total content, per cent.	Per cent. recovery.	Grain size.
Aluminium.						
SAE 4815	9	0.14–0.18	16	0.013–0.051	29–115	6–8
			Mean:—	0.038	85.1	
Vanadium.						
SAE 4815	7	0.14–0.18	27	0.066–0.098	88–130	5–7
AISI 4815	4	0.15–0.17	27	0.07 –0.08	93–106	5–8
			Mean:—	0.078	104	

Remarks: Uniformly fine grain size is obtained. One sample showed a high aluminium content of 0.088 per cent., equivalent to 110 per cent. aluminium recovery. This could be attributed to addition to the mould.

Works E

The steel is made in a 10-ton basic electric furnace. Aluminium in pellet form is added gradually by hand to the trumpet during teeming. Usually, four 50-cwt. ingots are cast on a plate.

recoveries at times are higher than 100 per cent. These may be due to high vanadium content of the alloy (results are calculated at 50 per cent. V content) or due to the practice of inaccurately weighing the amounts required.

Chemical analysis, En 19 sample:—Soluble Al, 0.034 per cent.; insoluble Al, 0.0055 per cent.; nitrogen, 0.0116 per cent.; spectrographic Al, 0.040 per cent.

Aluminium content range, 0.02 to 0.05 per cent.

TABLE 11.—*Works E—Basic Electric Process* (0.40 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total, Al per cent.	Percentage Al recovery.	Grain size.
En 19	9	0.41–0.45	16	0.019–0.050	53–111	5–8
			Mean:—	0.036	83.3	

TABLE 12.—*Works F—Basic Electric Process* (0.20 *and* 0.40 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al Added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.
0.20 *per cent. carbon.*	3	0.15–0.18	24	0.02–0.05	31–64	Fine
—			Mean:—	0.037	51.5	
0.40 *per cent. carbon.*	14	0.39–0.44	20	0.023–0.04	40–70	Fine
—			Mean:—	0.035	60.1	

Aluminium recovery range, 50 to 90 per cent. Grain size, uniformly fine.

Remarks. A uniformly fine grain size is obtained by trumpet additions of aluminium.

Works F

Aluminium addition of 20 oz./ton is made in the form of 2-lb. bars to the ladle. Care is taken to prevent the tapping of slag with metal, and aluminium is thrown in the stream. Of four, six, or eight ingots per plate, one ingot is marked and tested after rolling to bar.

The collected data on samples are given in Table 12.

Chemical analyses (per cent.):—

	Sol. Al.	Insol. Al.	Nitrogen.	Spectrographic Al.
0.2 per cent. C sample ..	0.029	0.0037	0.0133	0.04
0.4 per cent. C sample ..	0.027	0.0061	0.0131	0.04
0.4 per cent. C sample ..	0.028	0.007	0.0136	0.036

Aluminium content range, 0.02 to 0.05 per cent. Aluminium recovery range, 30 to 70 per cent. Grain size, uniformly fine.

Remarks: A uniform fine grain size is obtained with a high average recovery of aluminium (55 per cent.).

BASIC OPEN-HEARTH PROCESS

Works A

The heat is blocked with sufficient ferro-silicon to arrest the carbon drop. It is tapped after about 15 min. Ferro-manganese and ferro-silicon additions are made to the ladle to bring the steel up to specification, and subsequently about 10 oz./ton of aluminium is added to the ladle. The remainder of the aluminium addition, about 20 oz./ton, is made to the moulds.

The collected data on samples are given in Tables 13 and 14.

Chemical analysis, En 352 sample: Soluble Al, 0.021 per cent.; insoluble Al, 0.013 per cent.; nitrogen, 0.0065 per cent.; spectrographic Al, 0.042 per cent.

Aluminium content range, 0.025 to 0.045 per cent. Aluminium recovery range, 20 to 55 per cent. Grain size, uniformly fine.

Remarks: A uniform fine grain size is obtained with fairly high average recovery of aluminium.

Chemical analysis, En 8 sample: Soluble Al, 0.029 per cent.; insoluble Al, 0.0046 per cent.; nitrogen, 0.0084 per cent.; spectrographic Al, 0.035 per cent.

Aluminium content range, 0.02 to 0.055 per cent. Aluminium recovery range, 15 to 90 per cent. Grain size, uniformly fine.

Remarks: Uniformly fine grain size is obtained with fairly high average aluminium recovery.

Works B

At first, ferro-silicon and ferro-manganese are added in the ladle. Then 16 oz./ton of aluminium

TABLE 13.—*Works A—Basic Open-hearth Process* (0.20 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.
En 51	1	0.16	30.4	0.041	48	7–5
En 51	1	0.17	27.2	0.037	48.9	7
En 352	5	0.14–0.18	28.8	0.015–0.041	18–51	7–6
En 352	3	0.16–0.17	30.4	0.042	49	7–7
Ni-Cr-Mo	1	0.26	30.4	0.038	44.6	7
SAE 8727	1	0.26	27.2	0.037	57.5	8–5
			Mean:—	0.036	44.9	

TABLE 14.—*Works A—Basic Open-hearth Process* (0.40 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.
En 8	2	0.44–0.48	25	0.035–0.044	54.62	7
En 8	1	0.43	30.4	0.012	14.1	7
En 8	3	0.40–0.45	16 (mould)	0.018–0.023	39–50	7–8
En 12	3	0.33	20 (mould)	0.045–0.048	68–85	5–7
En 12	5	0.33–0.45	28	0.023–0.045	33–56	6–8
En 12	5	0.35–0.41	30.4	0.015–0.054	17–64	7.8
En 12	1	0.46	32	0.041	46.2	8
En 15	1	0.39	24	0.047	73	8
En 15	1	0.34	28.8	0.048	68	8
Carbon	2	0.44	16 (mould)	0.028–0.042	60–93	7
			Mean:—	0.037	55.4	

TABLE 15.—*Works B—Basic Open-hearth Process* (0.20 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.
En 34	2	0.17–0.18	32	0.017–0.028	18–31	5–8
En 34	19	0.15–0.22	36	0.011–0.067	11–67	5–8
			Mean:—	0.029	29.6	

is added in stick form when a pool of metal has formed in the ladle. Ferro-titanium (40 per cent. Ti) is often used as a joint addition with aluminium.

The collected data on samples are given in Tables 15 and 16.

Chemical analysis, En 34 sample: Soluble Al, 0.022 per cent.; insoluble Al, 0.007 per cent. nitrogen, 0.008 per cent.; spectrographic Al, 0.026 per cent.

Aluminium content range, 0.015 to 0.067 per cent. Aluminium recovery range, 15 to 66 per cent. Grain size, uniformly fine.

TABLE 16.—*Works B—Basic Open-hearth Process* (0.40 *per cent.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.	Titanium content.
En 18 ..	3	0.35–0.39	16	0.016–0.030	35–67	5–8	No Ti addition
En 18 ..	4	0.35–0.37	18	0.024–0.025	46–50	5–8	No Ti addition
En 18 ..	4	0.37–0.46	20	0.012–0.028	21–50	5–8	No Ti addition
En 18 ..	10	0.31–0.43	16	0.016–0.025	31–56	5–8	0.025–0.034
En 18 ..	1	0.34	18	0.016	32	5–8	0.03
			Mean:—	0.021	44.02		

Remarks: A uniformly fine grain size is obtained.

Chemical analysis, En 18 sample (without Ti): Soluble Al, 0.020 per cent.; insoluble Al, 0.0027 per cent.; nitrogen, 0.0087 per cent.; spectrographic Al, 0.024 per cent.

Aluminium content range, 0.012 to 0.03 per cent. Aluminium recovery range, 20 to 60 per cent. Grain size, uniformly fine with an average of 6 to 7.

Remarks: A uniform fine grain size is obtained with fairly high average recovery of aluminium. Ferro-titanium is useful as a joint addition: as well as controlling grain size, it is considered to reduce the incidence of longitudinal panel cracking in ingots.

Works C

The aluminium for grain size control is added to the ladle, in the form of sticks or as an alloy, Alsimin containing 42 per cent. Al and 31 per cent. Si.

For SAE 8620 and SAE 8615, 24 oz./ton of aluminium is added and for SAE 8645, 14 oz./ton is used.

In the case of low-carbon melts, 5 lb. extra of Al is added for high tapping temperature (between 1,600 and 1,620 deg. C.), or 10 lb. if this temperature exceeds 1,620 deg. C.

Compensating aluminium is added during teeming as follows:—2 oz./ton down each trumpet on the first two plates; 4 oz./ton down each trumpet on the third plate; 4 oz./ton down each trumpet on the remaining plates.

The steel is teemed through two nozzles.

Collected data on samples are given in Tables 17 and 18.

TABLE 17.—*Works C—Basic Open-hearth Process* (0.20 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.
SAE 8620	2	0.21–0.23	24	0.016–0.023	23–34	6–8
SAE 8620	1	0.20	24	0.011	16	4–7
SAE 8620	10	0.20–0.23	25	0.013–0.027	18–39	6–8
SAE 8620	7	0.20–0.23	26	0.018–0.026	25–36	7–8
SAE 8615	1	0.17	24	0.023	34	7–8
			Mean:—	0.021	29.8	

TABLE 18.—*Works C—Basic Open-hearth Process* (0.40 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al per cent.	Percentage Al recovery.	Grain size.
SAE 8620	14	0.43–0.48	14–16	0.014–0.02	31–50	5–8
SAE 8620†	1	0.44	16	0.012	26.8	40 per cent. 2–4 60 per cent. 5–7
SAE 8620	1	0.45	16	0.014	31.2	5–7 with some 4–5
SAE 8620	3	0.44–0.46	15–16	0.014–0.015	31–33	6–7 with few 4
SAE 8620‡	2	0.44–0.49	14–15	0.018	46	5–7 with few 4
SAE 8620	1	0.48	14	0.020	51.2	6–8 with few 4
			Mean:—	0.017	38.9	

TABLE 19.—*Works A—Acid Open-hearth Process* (0.20 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.
En 16	1	0.28	20	0.027	47	8
SAE 8620	3	0.21–0.23	20	0.024–0.03	41–52	7–8
Ni–Cr	4	0.20–0.22	20	0.021–0.031	36–53	7–8
Ni–Cr–Mo	1	0.16	20	0.032	55	7
SAE 8622	1	0.20	20	0.027	47	7
			Mean:—	0.028	48.0	

Chemical analysis, SAE 8620 sample: Soluble Al, 0.022 per cent.; insoluble Al, 0.0029 per cent.; nitrogen, 0.0053 per cent.; spectrographic Al, 0.025 per cent.

Aluminium content range, 0.011 to 0.026 per cent. Aluminium recovery range, 16 to 37 per cent. Grain size, mainly fine grained.

Remarks: Uniform fine grain size is obtained with a 30 per cent. average recovery of aluminium. One sample had a few coarse grains (ASTM No. 4). Analyses of this sample showed that the aluminium content was 0.011 per cent.

Chemical analyses (per cent):

	Sol. Al.	Insol. Al.	Nitrogen.	Spectrographic Al.
SAE 8620 (fine grain) ..	0.014	0.004	0.0056	0.019
†SAE 8620 (mixed) ..	0.010	0.0037	0.0064	0.012
‡SAE 8620 (fine with few 4)	0.012	0.0033	0.0052	0.018

Aluminium content range, 0.01 to 0.02 per cent. Aluminium recovery range, 30 to 50 per cent. Grain size, mostly fine with a few coarse grains.

Remarks: As aluminium added is only 16 oz./ton, even with low aluminium contents a fairly high average (39 per cent.) recovery is obtained. Samples containing less than 0.015 per cent. aluminium show a tendency towards mixed grain size. Three samples with aluminium contents of 0.018 to 0.02 per cent. had few coarse grains (ASTM No. 4). Chemical analyses of one of these samples indicated:—0.012 per cent. acid sol. Al + 0.0033 per cent. acid insol. Al = 0.0153 per cent. total aluminium.

ACID OPEN-HEARTH PROCESS

Works A

Ferro-silicon is initially added and ferro-manganese addition is made 10 min. before tapping. Aluminium addition is to the ladle in stick form. In addition to aluminium, 10 oz./ton of Alsimin, equivalent to 4 oz./ton of aluminium, is sometimes added.

The collected data on samples are given in Tables 19 and 20.

Chemical analysis: Ni-Cr sample: Soluble Al, 0.018 per cent.; insoluble Al, 0.0051 per cent.; nitrogen, 0.0067 per cent.; spectrographic Al, 0.028 per cent.

Aluminium content range, 0.02 to 0.032 per cent. Aluminium recovery range, 40 to 55 per cent. Grain size, uniformly fine.

Remarks: a uniform fine grain size is obtained with fairly high average recovery of aluminium.

Chemical analysis, En 18 sample: Soluble Al, 0.027 per cent.; insoluble Al, 0.0051 per cent.; nitrogen, 0.0073 per cent.; spectrographic Al, 0.037 per cent.

Aluminium content range, 0.021 to 0.048 per cent. Aluminium recovery range, 36 to 78 per cent. Grain size, uniformly fine.

Remarks: A uniform grain size is obtained with a high average recovery of aluminium.

Works D

Ferro-silicon is added for killing when the desired carbon level is reached. FeSi and FeMn additions to obtain specified composition are usually made to the ladle. If the quantity required is excessive, part of the FeMn is added to the bath. All aluminium additions are made to the ladle in stick form.

The collected data on samples are given in Table 21.

Chemical analysis, En 18C sample: Soluble Al, 0.030 per cent.; insoluble Al, 0.0039 per cent.; nitrogen, 0.0034 per cent. spectrographic Al, 0.037 per cent.

Aluminium content range, 0.033 to 0.058 per cent. Aluminium recovery range, 43 to 67 per cent. Grain size, uniformly fine.

Remarks: A uniform grain size is obtained with fairly high average recovery of aluminium.

SUMMARY AND CONCLUSIONS

In the production of fine-grained steels, aluminium is added towards the final stages of the steelmaking operation. From the data available from the literature it can be seen that 0.01 per cent. to 0.05 per cent. aluminium inhibits grain

TABLE 20.—*Works A—Acid Open-hearth Process* (0.40 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.
En 12	6	0.39–0.45	20	0.032–0.042	55–73	8
En 18*	9	0.38–0.42	16+4	0.039–0.048	69–78	6–8
En 18*	1	0.42	12+4	0.021	36.5	6–7
En 100	5	0.38–0.44	20	0.028–0.039	48–68	6–8
En 111	1	0.38	20	0.036	62	7
			Mean:—	0.037	63.8	

* 10 oz./ton of "Alsimin" equivalent to 4 oz./ton of Al is added to the ladle.

TABLE 21.—*Works D—Acid Open-hearth Process* (0.40 *per cent. C.*).

Steel specification.	No. of samples.	C, per cent.	Al added, oz./ton.	Total Al, per cent.	Percentage Al recovery.	Grain size.
En 18	1	0.38	27	0.058	50	6–7
En 18C..	5	0.36–0.38	27	0.033–0.051	43–67	5–7
			Mean:—	0.043	52.1	

growth by raising the grain coarsening temperature of the steel. A minimum content of 0.015 per cent. aluminium in the steel seems to be necessary to obtain fine grain size consistently. In practice, aluminium is added by various methods in varying amounts. The amount added is considerably in excess of the minimum 0.015 per cent. necessary; yet the consistency of the grain size is not always guaranteed.

The aluminium contents of the steels examined vary within a wide range. Consideration of the chemistry of aluminium in steel briefly gives an idea of how aluminium should be used for grain control and how wastage occurs.

The collected data compare practices used at various works. They show how the aluminium contents vary with the practice and the effect of these contents on the grain size obtained. The most common practice seems to be that of adding aluminium in the ladle. Furnace, launder, trumpet, and mould additions are also made. Mould and trumpet additions are the most effective with the least loss of aluminium. Ladle additions of aluminium seem to give satisfactory grain size control when proper care is taken to avoid slag mixture with the metal. The aluminium necessary for grain control can be introduced into the steel by proper care—for example, by throwing the aluminium as near to the tapping stream as possible.

The grain size of acid open-hearth steel is easier to control. Recovery of aluminium is high and fine grain size is obtained with moderate additions of aluminium.

At one works, 0.075 per cent. vanadium is used to give satisfactory grain control with a high recovery of vanadium. Joint additions of aluminium and titanium also give effective grain control.

The collected data seem to confirm the observations of Washburn[1] and Ressler[3] that fine-grained steels could be consistently produced with aluminium contents of 0.015 per cent. and above. It is of interest to note that Ressler[3] carried out further spectrochemical and aluminium determinations on 2,000 heats with continued verification of the previous results.

The McQuaid-Ehn test seems to be universally accepted as a means of quantitatively determining the grain size of steels. Most carburizing treatments and other heat treatments are carried out considerably below the temperature of 925 deg. C. used in this test. Hence, the McQuaid-Ehn test seems to be unduly strict in specifying the grain size requirements of steels for engineering and heat-treating applications. With rapid advances in new methods of chemical analysis many steelworks are installing spectrographic equipment. Determination of the aluminium content of steel therefore seems an ideally rapid and economical method of evaluating grain size.

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USE OF NATURAL GAS in blast furnaces has been the subject of tests carried out by Alpine Montan at Donawitz. It was shown that savings of coke of up to 10 per cent. could be achieved. Some time ago tests at Donawitz resulted in savings of coke of up to 5 per cent. through the addition of graphite in the blast furnace.

MINE MAINTENANCE AND MECHANIZATION

Worksop Area Central Workshops and Stores

The importance of maintenance for highly mechanized collieries is now fully recognized and the No. 1 (Worksop) Area central workshops and stores of the North-Eastern Divisional Coal Board illustrates the standard adopted by the NCB to ensure that power-loading machines and associated mining equipment are fully utilized.

COMPRISING 12 collieries, No. 1 (Worksop) Area of the North-Eastern Divisional Coal Board produces between 5,000,000 and 6,000,000 tons of saleable coal annually. The collieries are Brookhouse, Handsworth, Manton, Steetley, Dinnington, Kiveton Park, Orgreave, Thurcroft, Firbeck, Maltby, Shireoaks, and Treeton.

All collieries have considerable mechanical and electrical plant and, at several, over 80 per cent. of the output is produced by power loaders. The Area average for power loading is at present about 60 per cent. of the saleable tonnage and schemes are in hand to effect a considerable increase.

The need to ensure a high standard of maintenance for this power-loading equipment, and to make the best use of available craftsmen for servicing and repairing other equipment led to proposals for the establishment of Area central workshops. Area central stores were included in the project to provide on-the-spot spares for the workshops, to centralize holdings in many stock items, and thus reduce the overall value of stores held and permit economies in purchasing.

The site chosen for the installation was that of the old Fence Colliery, Woodhouse Mill. The colliery had been closed for many years, but the site which was vested in the National Coal Board had many advantages. It was reasonably central and adjoined both a main trunk road and a main railway line.

The design of both the workshops and stores is in accordance with standards laid down by the NCB, and both are typical of installations in other Areas throughout the country.

Welfare facilities include a modern locker room with wash columns and showers with a spacious and well-designed canteen for all employees. There is a fully equipped medical treatment room, which is manned by a member of the workshops staff and supervised by a qualified nurse and the Area medical officer.

The general layout of the workshops and stores is shown in Fig. 1.

The main workshops building provides a working floor space of 240 ft. by 240 ft. divided by crane gantries into four bays each 60 ft. wide. At present

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En 18	1	0.38	27	0.058	50	6–7
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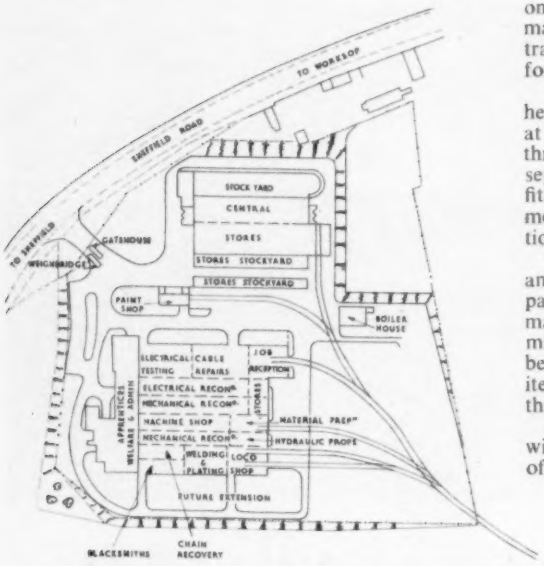

FIG. 1.—GENERAL LAYOUT OF THE WORKSOP AREA CENTRAL WORKSHOPS AND STORES.

140 men are employed, but as the work load increases more men will be engaged up to the planned total of 300. The present organizational pattern is shown in Fig. 2.

The administrative block forms part of the main structure of the workshops, and is so arranged that the manager and his technical staff shall have immediate access to the workshops area. The major part of the workshops' activities will be concerned with the servicing of power loaders and their associated equipment, but many other repair and maintenance functions will be undertaken.

To keep the work load at a reasonably constant level an accurate assessment has been made of the plant and machinery in the Area and the times at which it will need to be serviced. From this information a work programme is developed to provide a steady input to the workshops and at the same time to maintain some spare capacity to meet emergencies.

This programme also permits planned ordering of spares and the avoidance of large stocks of particular items. Although the Area central stores are adjacent, the workshops maintain their own operational store house for the issue of consumable items and spares for the maintenance programme.

Overhead cranes varying from 5 to 20 tons' capacity are installed in each of the workshop bays and mechanical handling and light lifting equipment is installed. Apart from training on the shop floor the workshops contain a craftsman training section which will cater for advanced training of boys recruited under the board's scheme for the training of craft apprentices.

The workshops, and the stores, are centrally heated by a pressurized hot-water system working at 100 lb./sq. in. pressure and at 300 deg. F. through wall-mounted panel heaters. There is a separate boilerhouse containing Cochran boilers fitted with automatic stokers, and control equipment is so arranged as to require minimum attention.

The job reception section receives all mechanical and electrical equipment sent for overhaul or repair (except for electric cables). All items are dismantled and each component is examined to determine whether it can be re-used or whether it should be reconditioned or scrapped. All except electrical items are steam cleaned at the reception stage and thus all dirty work is concentrated in this section.

The cable repairs section is a self-contained unit within the workshops and repairs up to 350 cables of various sizes per month.

All equipment is dealt with in the electrical reconditioning section and either put into store until required or fed along cross-service roads to join its mechanical component or returned to the colliery from which it came. At present such items as flameproof switchgear, electric motors, and electrical boring machines are being reconditioned.

Procedure for the reconditioning and disposal of both power-loading and conveyor equipment is similar to that for the electrical section, with power loaders being overhauled to a schedule based on the needs of the mechanization programme (Fig. 3).

The materials preparation section is responsible for the provision of material for the fabrication and machine sections. The services provided include shearing, cold sawing, and oxyacetylene profile burning.

The hydraulic prop servicing section is being developed to service all the varying types of hydraulic props which are being extensively used in the Worksop Area in connection with mechanized mining.

The facilities in the machine bay include planing, milling, shaping, slotting, drilling, and turning. The equipment installed is intended to cater for all machining operations on the equipment passing through the workshops.

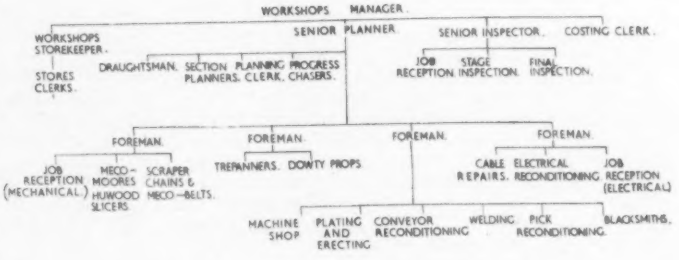

FIG. 2.—PRESENT ORGANIZATIONAL PATTERN.

FIG. 3.—ELECTRICAL AND MECHANICAL RECONDITIONING BAYS.

The recovery section is playing an important part in avoiding a shortage of mining-machinery spares. In addition, it is enabling considerable economies to be made by reconditioning, at a low cost, a number of expensive items which would otherwise have to be scrapped. The methods used for recovery are eutectic (low-temperature welding), metal spraying, and brush plating (electrolytic process).

Other sections include a blacksmiths' shop, a pick-sharpening section for the reconditioning of all cutter picks (excluding special tungsten carbide) used in the Area at the rate of 10,000 per month, a welding fabrication section where in addition to repair and recovery of machine components the section will manufacture a number of special items designed in the Area, and locomotive and boiler repair shop.

At present, all plant is inspected when received and again before despatch. It is envisaged that as the workshops develop, stage inspection will be undertaken.

Central Stores

The Area central stores have been constructed primarily to provide a service to the central workshops. In addition, however, they provide proper storage facilities for items which might otherwise have to be kept in the open at collieries and permits savings both in values of stocks held and in the economies which arise from bulk purchases for delivery at one point. Control of stocks by Area officers is facilitated and colliery storekeepers are able to provide a better service to users.

The stores building consists of two bays, each 60 ft. wide by 210 ft. long, giving a total inside storage area of 25,200 sq. ft. It has brick walls up to a height of some 10 ft. and above that, asbestos cladding on a steel framework. In addition, there are outside stacking areas at present amounting to some 35,000 sq. ft.

One of the bays in the central stores is served by a floor-operated 10-ton overhead gantry crane, and is designed primarily for heavy materials and equipment which will normally be stored on the floor (Fig. 4). There are pallet racks down the side of this bay to utilize the space under the crane supports where the crane cannot easily operate. A rail track leads into one end of this bay, thus allowing wagons to be unloaded under cover by the overhead crane.

The other bay is at a higher level than the one served by the overhead crane, and is designed for lighter materials: it accommodates two-tier steel binning to a total height of 13 ft. 3 in. and pallet racking and post pallets which are used for items too big or too heavy to put in the bins. A "reach" forklift truck of 2-ton capacity is used to handle the pallets, etc. This truck can readily operate in an aisle width of 8 ft. There are loading/unloading bays of the "saw tooth" design at each end of this bay; these are at lorry tail board height and

FIG. 4.—HEAVY MACHINERY SECTION OF THE CENTRAL STORES.

enable vehicles to be easily loaded or unloaded under cover.

The outside stacking areas are of consolidated shale with concrete access roads. A 10-ton jib crane is used to handle the outside materials. There is rail access to part of this stacking area.

The main purpose of the central stores is to serve the adjacent Area central workshops, and therefore the main types of materials stocked are units of coal-face machinery awaiting installation and spares for the many cutters, loaders, conveyors, and other types of equipment repaired in the workshops.

Others items stocked in the central stores include a range of general stores used at most or all collieries, *e.g.*, nuts and bolts, cleaning materials, etc., stationery and medical items, and the common sizes of steel plates and sections. All these are distributed to collieries on a regular " milkround " basis and two lorries, one fitted with its own crane, are operated for this purpose. In addition, the central stores hold emergency supplies of equipment such as firefighting hose and pipes, etc.

The total staff (clerical and manual) employed in the central stores numbers 18, including the two lorry drivers. As the central stores are manned for 24 hr. a day, certain members of the staff are employed on the afternoon and night shift. In addition, there are eight staff concerned with keeping records and provisioning, situated in an office adjacent to the central stores. Although some new staff were recruited when the central stores were first commissioned, the majority of them were transferred from stores at other collieries in the Area.

ACCIDENTS AT MINES

SOME AVOIDABLE INSTANCES

BRIEF accounts based on reports of HM Inspectors of Mines and Quarries draw attention to some of the fatal accidents which might have been avoided during the second quarter of this year.

A hewer was getting coal in a seam worked by pneumatic picks where the damp sandstone roof was pre-fractured due to the extraction of several lower seams when he was fatally injured by a fall of roof which reeled out the last bar setting from the place on the buttock where he was working. He had been instructed by the deputy to watch the broken roof and to set temporary supports to the exposed roof, but had neglected to do this.

The driver of a diesel locomotive was found dead trapped between the locomotive and a ventilation door in a haulage road inclined at 1 in 20. It appears that he dismounted either to open or close the door, leaving the engine running and hand brake in the " off " position. Had he applied the brake the accident might have been avoided.

A stable hole stripper went along a shearer loader face to collect tools before coal getting began on a filling shift. Without warning, the loader operator foolishly attempted to return to the stable hole by crawling between the front of the loader and the coal face. The shearer drum was rotated in the course of pick changing and he was fatally injured when caught by the revolving picks.

At the surface of a large colliery where movements of mine cars and tipplers are controlled by an operator from an elevated cabin, a tub manipulator went between a stationary full car and the front of the tippler in order to clean and oil the tippler stop arm. The operator was unaware that he was there and released the mine-car stops and the tub manipulator was instantly killed when his head was crushed against the tippler as the mine car moved forward. If the tub manipulator had given the usual hand signal and received an acknowledgment signal from the operator this accident would not have occurred.

As two apprentice fitters carrying a machine to the pithead were passing between two stationary full wagons one of the wagons bumped forward when struck by another gravitating behind it and one of the apprentices was crushed between the buffers. The apprentices had been warned on previous occasions to take the proper route to the pithead via the screens gantry which crossed the wagon ways and the accident would have been avoided if they had done so on this occasion.

On a prop-free-front face a waste drawer, drawing a bar setting from the waste, withdrew the face-side friction prop and was using a hammer to release th wedge of the waste-side prop when the waste collapsed on to him and killed him. If the waste-side prop had been withdrawn first as required by the Support Rules the accident might not have occurred.

Vimarc Feeders, Conveyors, and Screens

WIDE range of vibratory handling equipment is being introduced by the British Manufacture & Research Company, Limited, Springfield Road, Grantham (Lincs). Included is a Vimarc feeder designed to deliver up to 400 ton/hr., powered by two rotary vibrators. In addition to the feeder, a vibratory conveyor with similar drive is available in multiple lengths of 20 ft. This conveyor is specially suitable for handling hot, abrasive, and dusty materials, an additional advantage being that a number of inlets and outlets can be incorporated and a totally enclosed system still maintained.

A further Vimarc product is a linear action screen, which can be installed horizontally so that material is actually conveyed forward by the cloth, thus obtaining the best possible screening.

All these machines are of basically similar design and have only two moving parts, the independently powered electrical vibrators. Maintenance is therefore kept to a minimum, and the freely sprung mounting ensures that no vibration is transmitted to the supporting steelwork.

National Association of Colliery Managers

SOUTH WALES BRANCH ANNUAL DINNER

Mr. A. E. Hiscox on "Today's Problem"

COAL and men were out great national resources, and together had built up Britain's industrial strength in the years which had passed: today's problem was how to make the best use of both, knowing that roughly three quarters of the country's fuel and power was derived from coal, said Mr. A. E. Hiscox, president of the National Association of Colliery Managers, at Porthcawl last Friday. That problem, he believed, presented to South Wales its greatest challenge—a challenge to the miner and to the mining engineer, and to the mechanical and electrical engineers.

Mr. Hiscox was replying to the toast of the coal industry and the National Association of Colliery Managers at the annual dinner of the South Wales branch of the association, over which Mr. A. Maddox presided.

MR. A. E. HISCOX

Mr. A. H. Kellett, chairman of the South-Western Divisional Coal Board, who proposed the toast, said that the coal industry always faced challenges of one kind or another. In South Wales the industry had reached the stage where a large amount of money had been spent on colliery reconstructions, and the nation was now looking for the results. Such results were usually delayed, but in the end they came.

Meeting the Demand

South Wales mined grades of coal which were still required in great quantities, said Mr. Hiscox. They included anthracite, dry steams, and 65 per cent. of the country's coking coals. The anthracite and dry steams were splendid smokeless fuels, and they were wanted now, in anticipation of the winter. If they were not made available in the quantities needed all the industry's publicity over the last 12 months in efforts to combat the competition of oil would be wasted.

The National Coal Board had apportioned to the division roughly £200,000,000 to be spent on reorganization and mechanization. That was where the challenge lay. They had the grades of coal which were required, but, because of the employment position in South Wales, they had lost many men, and although the position had steadied, they were still losing manpower. He did not think it was because of remuneration that people were leaving the industry. It was a question of security. Sensible, serious thinking men of good standing, they looked to the future, and looking ahead they wanted security, which, of course meant a regular pay packet. Many of those sensible people, because of petty differences of a minority causing sectional strikes, which made a man's pay packet vary from week to week, did not consider that this was security. They were leaving the mines, and it was those people whom they could ill afford to lose.

Mr. Hiscox continued: "It means that management and men must face their full responsibility, and this can only be done by harder work, greater efficiency, and a will on everyone's part to eliminate unofficial strikes and use the conciliation machinery laid down by both sides of this industry, which I believe to be the best in the world."

A sum of money had been apportioned to South Wales, but there were bound to be certain reservations. Lord Robens had made it clear that where money was spent it must give reasonable returns. They had the coal, but they must get better results; they had the men, and to keep them they needed better understanding with them. They had the money, but it must be well invested, and they must have better results.

Mr. Hiscox said the NACM had a very important part to play. Its standards of safety must be adhered to. No one could fail to be perturbed by the annual accident figures. The year of 1962 would be a "safety year." Details of that campaign would be issued shortly.

Toast of the guests, proposed by Mr. F. C. Thompson, a vice-president of the branch, was replied to by Prof. J. Selwyn Caswell, president of the South Wales Institute of Engineers.

THE NORTH WESTERN GAS BOARD has received an order from the Corporación Venezolana de Guayana for 20,000 tons of coke for use in the steel plant now nearing completion, according to the Bank of London & South America.

COAL FOR WESTFIELD LURGI PLANT

COAL for the Lurgi gasification plant at Westfield (Fife) is being produced by the National Coal Board from an adjacent open-cast mining site capable of yielding between 20,000,000 and 25,000,000 tons of raw coal throughout its estimated working life of 25 years. About one third of the annual output will be supplied to the Lurgi plant, leaving a substantial balance for general industrial purposes.

Maps made in the 17th century show the area as having been a loch, and the presence of a small coalfield is a phenomenon, being placed on top of the Millstone Grit thousands of feet above the succession of the Fife coalfield. The site is just under 1½ square miles in extent and the total thickness of the coal-bearing strata is about 400 ft., although there is considerable variation in thickness from the outcrop on the outer edge to the deepest point in the north, where the coal is at a depth of 700 ft.

It is planned to excavate approximately 125,000,000 cu. yd. of material, from which the raw coal will be obtained. To enable the coal to be won, it will be necessary to remove about 50,000,000 cu. yd. of material from the coal-producing area, ultimately leaving a void. This will be formed into a loch, with appropriate landscaping for amenity purposes. The remainder of the area will ultimately be restored to agriculture.

Small-scale Scheme Abandoned

Open-cast mining was carried out on a small scale in 1944 by the NCB, but this work was soon abandoned in favour of a large-scale scheme when the complete reserves became known. Work on this started in 1955 and in 1956 contracts were let for the diversion of the Lochty Burn and public services running through the site, and for the construction of a large reservoir containing the excavated peat and silt in the south-east corner.

The first essential in the development of the mine was to remove the peat and silt covering 72 acres at the southern end of the site. Approximately 4,300,000 cu. yd. of peat and sand were removed from this area and deposited through pipes into the reservoir provided. This work was completed by August, 1959, and the method adopted proved to be efficient, rapid in execution, and cheap compared with previous methods used for handling peat and running sand.

The actual working of the mine presents some difficulty owing to its great depth, the varying dip of the coal, and the interbanded nature of the coal seams and shale. It was considered essential to remove a considerable volume of material from the southern end of the coaling area, and after consultation with German firms, who, in their brown coal mines, have experience in the conveyance of overburden, it was decided to remove some 30,000,000 cu. yd. and to convey it to poor quality land nearby where it can be spread by machines.

Before it reaches the conveyors, some of the overburden must be crushed, and roll crushers have been installed. Two hammer crushers have still to be added to bring the equipment up to full capacity. In order to process the coal from the mine, it was necessary to construct a disposal centre comprising, reception hoppers and two large storage bunkers for the raw coal. In addition, there is a dense-medium washery complete with slurry press plant and all the necessary loading, storage, and marshalling sidings.

The capacity of the washery is rated at 225 ton/hr. input, and the planned output is for 650,000 tons of saleable coal per year, of which approximately 140,000 tons will at present be absorbed by the Lurgi plant. The Lurgi demand under stage two of the project will be raised to gasify 270,000 ton/year.

Measurement of Smoke Emission From Industrial Boilers

THE BSI Committee which has been investigating the extent to which smoke from industrial boilers can be reduced by good practice has now published its second report. The report, covering coal-fired shell boilers with various types of mechanical stokers, is published as Part 2 of the British Standard on Measurements of Smoke Emission (BS 2978). It is unlikely that further reports, other than addenda to those already published, will be issued, as the majority of other plant in general use comes under the supervision of Government inspectors.

The report will be of value, as was the earlier document, to factory management and to local authorities in helping them to achieve a good standard of smoke control and compliance with the law under the terms of the Clean Air Act.

To obtain the material on which this report is based the BSI Committee carried out tests on eight shell boilers of modern design, known to be well operated, in various industrial establishments. Detailed records were kept of smoke emission from each of these plants over periods of from three to eight weeks. The final conclusion is that "dark smoke from well-designed and correctly operated shell-type boilers with mechanical firing equipment of the types tested should not exceed 8 min. in any period of 8 hr."

Copies of BS 2978, Part 2, may be obtained from the British Standards Institution, Sales Branch, 2, Park Street, London, W.1, price 7s. 6d. (postage extra).

A PLANT for the manufacture of secial steels is to be set up at Mogi das Cruzes, São Paulo. The Companhia SKF of Brazil and the Icomi group, in which the Bethlehem Steel Company is associated with Azevedo Antunes, are to join in the project.

SIMMONDS AEROCESSORIES, LIMITED, Treforest (Glam), a member of the Firth Cleveland group, announces the introduction of the first precision-forged self-locking nuts to be made available in this country. The immediate range, available through the normal supply channels, covers Nyloc self-locking nuts in all the sizes, in both full and thin thicknesses, from ¼ in. to ½ in. dia. in unified fine thread.

NEW LITERATURE

COPIES of the house magazines, catalogues, booklets, and other publications referred to below are usually available to our readers on application, which should be made to the address given, mention being made at the same time of this journal.

RECONTAINERS, LIMITED, Green Lane, Hounslow (Middx)—Details of the company's reconditioned jerricans are contained in four new pamphlets.

TARMAC, LIMITED, Ettingshall, Wolverhampton—Included in the September number of Tarmac in Review are details of a number of steelworks' contracts now being undertaken by companies of the group. One of them concerns the preparation of the way for the world's largest electric steelmaking plant at Steel, Peech & Tozer (branch of the United Steel Companies, Limited).

FOLLSAIN-WYCLIFFE FOUNDRIES, LIMITED, Lutterworth, near Rugby—The latest issue of the company's "Newsletter" is dated September, but it is the first to be published for a very considerable time, with the result that many of the events reported took place even before the end of last year. No doubt, however, the brightly written accounts will recall happy memories for many.

SOUTH AFRICAN IRON & STEEL INDUSTRIAL CORPORATION, LIMITED, P.O. Box 450, Pretoria—An article in the August issue of Iscor News makes the claim that "deep-drawing quality sheets, produced by Iscor, have proved superior to those previously imported, and their better drawing qualities have simplified the production process at a firm engaged in the manufacture of seamless containers."

MORGANITE RESEARCH & DEVELOPMENT, LIMITED, Battersea Church Road, London, S.W.11—The company has issued a leaflet (MRD 1) on "'Metamic' Pyrometer Sheaths." These sheaths, it is stated, are impervious and very refractory. They have cold strength equal to cast iron, excellent thermal shock resistance and slag resistance, with high thermal conductivity. They combine the advantages of ceramic sheaths with those of metal tubes.

INSTITUTION OF WORKS MANAGEMENT, 196, Shaftesbury Avenue, London, W.C.2—Five pages of the October issue of Works Management (2s. 6d.) are devoted to the subject of "Packaging and the Works Manager." The articles are intended to inform the works manager of trends in packaging during recent years from the point of view not only of materials and methods but also of the increasing importance of his participation in packaging decisions.

JOHNSON, MATTHEY & COMPANY, LIMITED, Hatton Garden, London, E.C.1—Among the articles published in the October number of Platinum Metals Review are:— "Palladium-on-charcoal Catalysts"; "The Contamination of Platinum Metal Thermocouples"; "The Gaseous Oxides of the Platinum Metals"; "Corrosion Resistance of Chromium"; "Creep Tests on Platinum Alloys," and "The Discovery of Iridium and Osmium." Abstracts of current literature on the platinum metals and their alloys are among the remaining contents.

BOWMAKER (PLANT), LIMITED, Noose Lane, Willenhall (Staffs)—The company is now in occupation of its new places of business at Cannock, Exeter, and Cardiff, the new South Wales branch at Culverhouse Cross, Cardiff, having been opened on September 26. The branch commands a prominent situation on the western city boundary. The autumn edition of Bowplant gives a detailed description of the premises and of those at Cannock and Exeter. The first item of mobile plant for the Spencer Works of Richard Thomas & Baldwins, Limited, a Caterpillar D4C tractor, was recently delivered to Llanwern for use in the stockyard at the sinter plant zone. Other items of news of Bowmaker plant are recorded in the magazine.

NEWTON, CHAMBERS & COMPANY, LIMITED, Thorncliffe, Sheffield—Every Monday morning's post brings us a copy of the Thorncliffe News (1d.), which certainly serves to keep its readers in close touch with the company's activities. The September 29 issue literally puts its readers right in the picture, for on the front page is a photograph, measuring 8½ in. by 7¼ in., of the RapieR W1800 walking dragline, which has just begun digging, lifting, and dumping 60 tons of rock and earth a minute at the Glyn Neath open-cast workings of the South-Western Divisional Coal Board. This giant machine was described in last week's IRON AND COAL. W. A. Wood, Thorncliffe's photographic manager, was responsible for the excellent illustration in the Thorncliffe News.

WILD-BARFIELD ELECTRIC FURNACES, LIMITED, Elecfurn Works, Otterspool Way, Watford By-pass, Watford (Herts)—First part of an article dealing with the analysis of high-melting and reactive metals using the vacuum fusion technique is printed in the September issue of the Wild-Barfield Heat-treatment Journal. The authors are Dr. G. L. Miller and J. A. Caldwell, research manager and chief chemist, research department, respectively, of Murex, Limited, Rainham (Essex). Other features of the issue include an article on a special-purpose machine in which shafts are hardened in a horizontal position and on a continuous basis and some details of the new Wild-Barfield NRC vacuum furnace, a small, self-contained, resistance-heated vacuum unit for temperatures up to 1,700 deg. C.

RUSTON-BUCYRUS, LIMITED, Lincoln—Although the summer number of the Digger did not make its appearance until the autumn was with us, it is still welcome, containing, as it does, a varied selection of items "for and about the employees" of the company. Among the folk we are introduced to is George Malt, who started work at the age of 14 in the time office of Ruston & Proctor, Limited. Now 58, and now in the receiving department of the general stores, George has had an interesting career in the service of the company and, for several years, in the service of his country in the Royal Artillery. Another personality introduced to readers of the magazine is Claude Shelley; he joined R-B 23 years ago and is now a chauffeur in the company's employ. Sport has played no small part in Claude's life, as the article relates. The Digger is an excellent example of a works magazine.

ST. JOHN AMBULANCE ASSOCIATION, Stores Department, St. John's Gate, London, E.C.1—The second edition of the association's manual on "Occupational First Aid," just published (4s. 6d. plus postage), is virtually a new publication. It is designed to supplement the standard first-aid training, laying emphasis upon the hazards in industry and how best to deal with casualties which may arise at work, and showing

the design and equipment of first-aid centres based on the latest developments in this field. Many factories, of course, have excellent medical reception centres, trained first-aid teams, and their own ambulances; they will welcome the book as a guide for their trained personnel. The book will be of particular value to the managements of smaller factories who wish the people in charge of their first-aid boxes to have a wider knowledge of their duties and responsibilities. It covers a wide field, from accident prevention to specific treatment of common injuries. A special section has been included for the first time to cover guidance in cases of illness rather than injury at work. Factory accidents and loss of life have increased to the highest for 10 years, according to the latest annual report of the Chief Inspector of Factories. The figure of 190,266 for 1960 is an increase of 9 per cent. over that for 1959. This book is a realistic attempt to minimize the effects of factory accidents.

ESSO PETROLEUM COMPANY, LIMITED, 36, Queen Anne's Gate, London, S.W.1—The most recent (Vol. XI, No. 4) issue of Esso Oilways is devoted to rubber and rubber products and, as usual, the issue is produced in identical form and with identical contents in six languages. Hessische Gummiwarenfabrik, Fritz Peter AG, Klein-Auheim, has been designing and making flat belts, V-belts, sponge rubber, and other articles from natural and synthetic rubber for over 50 years; the story of the company's achievements is told in words and pictures. Similarly treated is Hutchinson Italiana, which makes belts and other articles from natural and synthetic rubber bonded to natural and man-made fibres.

ATLAS COPCO (GREAT BRITAIN), LIMITED, Maylands Avenue, Hemel Hempstead (Herts)—The overburden drilling method, the name of a new technique whereby drilling is carried out through subsoil and boulders—also under water—to and through bedrock at faster penetration rates and much more economically than ever before, is the subject of an illustrated article in the latest (No. 3, 1961) issue of Compressed Air Comments. Developed by Scandinavia's biggest contractor, AB Skånska Cementgjuteriet, in co-operation with Atlas Copco and Sandvik Steel Works, the method was introduced on the Lindö canal project at Norrköping on Sweden's Baltic coast. Atlas Copco has secured the sole rights for exploiting the overburden drilling method outside Scandinavia. Other contents of the issue include an article on the use of the new U18 compressor for power stowing in coal mines.

BROKEN HILL PROPRIETARY COMPANY, LIMITED, Melbourne, Australia—From the time iron and steel production began in 1915 at Newcastle, the company realized that it was a necessity to provide the industry consuming ferrous products with every possible technical help. J. A. Burgess, the company's service superintendent, writing in the August number of the BHP Technical Bulletin, provides a brief outline of the technical service department's growth and operation, making reference to a number of interesting investigations undertaken by the service officers. Joint authors of "Preliminary Investigations into the Properties of Thin-gauge Tinplate" are J. LeBas, senior investigating metallurgist, and J. Johnson, metallurgist, flat products division, Port Kembla Steelworks, while T. G. Callcott, senior research officer, J. A. Innes, research officer, and N. A. Brown, research officer, central research laboratories, contribute "Continuous Production of High-strength Newcastle Coke." Also to hand is the August issue of the BHP Review, which, although more in the nature of a works magazine, also carries several interesting articles on the company's activities. The contents include "Stainless Steel," by Chesney Gardner, of the Commonwealth Steel Company, Limited, Newcastle, "Site Preparation for the Whyalla Steelworks," by K. Clothier, field engineer construction, Whyalla, "Research Report: Coal and Coke," by J. A. Gregory, assistant chief works research officer, Newcastle Steelworks, and articles on "Drift Portal Excavations at John Darling Colliery" and "Copper-plated Steel Strip—a New Product for the Australian market."

PROGRESS REPORT FROM *Daw Mill*

COAL winding is expected to start at Daw Mill, the first new shaft sunk in Warwickshire for more than 30 years, by mid-August, 1964. This £4,000,000 project will, in effect, be a new colliery, although it will be linked with the existing workings of Dexter Colliery to the north.

Daw Mill has three main objectives—to improve ventilation to the existing Dexter workings, to transport the output more efficiently, and to tap a large reserve of thick coal in the neighbourhood. Dexter shaft, the newest in the area after Daw Mill, was sunk to ease the southward drive of the workings, and its main return airway is to Kingsbury Colliery, to the north. But as the southward drive lengthened beyond the Dexter shaft, ventilation became increasingly difficult. Daw Mill will be the new coal-winding shaft, and the Dexter shaft, equipped with a new fan, will become the return air and manriding shaft.

Sinking started at Daw Mill in 1957, and the concrete-lined shaft, 20 ft. dia., was completed to a depth of 610 yd. two years later. A 500-yd. drivage was made to meet the advancing Dexter workings, and the link-up was effected with a remarkable small surveying error. Output from the Dexter workings will be moved to the new pit bottom by a 42-in. trunk conveyor, and a boom loader will transfer it to 4-ton capacity mine cars to be hoisted to the surface.

The coal-preparation plant will be of a type new to the West Midlands Division in layout. There will be no rail tracks running beneath the plant, which will consequently be more compact in construction. Rail wagons will stand on four parallel tracks adjoining the plant, and will be loaded by an overhead traversing gantry which will serve all tracks. Similar provision will be made for handling small coal.

The Daw Mill pithead, which stands in rolling farming countryside, will have no spoilheap. Run-of-mine dirt and preparation plant reject will be crushed and bunkered for return underground to be pneumatically stowed. During the sinking the shaft passed through the Warwickshire Thick Coal, which is 24 ft. 6 in. thick at that point, including just over a foot of dirt bands. The project is planned to increase annual output from 350,000 to 600,000 tons by 1965.

Forthcoming Events

OCTOBER 14

North of England Institute of Mining and Mechanical Engineers:—Meeting at Neville Hall, Newcastle-upon-Tyne 1, at 2.30 p.m. "The Automatic Monitoring System for the Haig Colliery Methane Drainage System," by H. S. Shillingford.

Institute of British Foundrymen (Scottish Branch):—Meeting at 2.30 p.m. Presidential address by J. S. McMillan and "Some Non-ferrous Castings for Mining Machinery," by R. Ferguson.

OCTOBER 16

North East Coast Institution of Engineers and Shipbuilders:—Opening general meeting in the Lecture Theatre of the Literary and Philosophical Society, Newcastle-upon-Tyne.

OCTOBER 17

South Staffordshire and Warwickshire Institute of Mining Engineers:—Annual general meeting at the Swan Hotel, Lichfield, at 3 p.m. Presidential address.

Institution of Production Engineers (Halifax Section):—Meeting at Huddersfield Technical College at 7.30 p.m. "Machine-tool Development in the USSR," by N. Stubbs.

Royal Institution of Naval Architects and Institute of Marine Engineers (Southern Joint Branch):—Meeting at the Royal Hotel, Cumberland Place, Southampton, at 7.30 p.m. "Metallurgy in Marine Engineering," by Dr. J. E. Garside.

OCTOBER 17-NOVEMBER 8

Iron and Steel Institute:—Special meeting in the United States and Canada.

OCTOBER 18

Institute of Marine Engineers (South Wales Section):—Meeting at the South Wales Institute of Engineers, Park Place, Cardiff, at 6 p.m. "Lloyd's Register of Shipping Requirements in the Testing of Welders," by F. B. Bowring.

Institution of Production Engineers (Birmingham Section):—Meeting at the Midland Hotel, Birmingham, at 7 p.m. "Recent Developments in Mechanical Transfer for Machines and Assembly," by Monsieur H. Bezier.

Institution of Production Engineers (Brighton Group):—Meeting at the Old Ship Hotel, Brighton, at 7 p.m. "Modern Trends in Machine-tool Design," by E. R. Cash.

Midland Counties Institution of Engineers:—Annual general meeting at the University, University Park, Nottingham, at 4 p.m.

Combustion Engineering Association (Midland Region):—Meeting at the Birmingham Chamber of Commerce, 75, Harborne Road, Edgbaston, Birmingham, at 10.30 a.m. "The Case for the Unattended Boilerhouse," by H. Hill and F. D. Brand.

Society of Chemical Industry (Corrosion Group):—Meeting at 14, Belgrave Square, London, S.W.1, at 6 p.m. "Volatile Corrosion Inhibitors," by E. L. Evans (National Chemical Laboratory) and R. I. Barraclough (Shell Chemical Company, Limited).

Institute of Welding (West of Scotland Branch):—Meeting at the Institute of Engineers and Shipbuilders in Scotland, 39, Elmbank Crescent, Glasgow, C.2, at 7 p.m. "Recent Developments in Corrosion-resisting Steels," by J. A. McWilliam.

Mining Institute of Scotland:—Meeting at the Mining Laboratories, 79, Grassmarket, Edinburgh, at 5.15 p.m. "Management Training," by L. E. Bourke, staff director, Scottish Divisional Coal Board.

OCTOBER 19

West of Scotland Iron and Steel Institute:—Meeting at 39, Elmbank Crescent, Glasgow, C.2, at 6.45 p.m. Presidential address, by Dr. R. Hunter.

Institute of Marine Engineers (West Midlands Section):—Meeting at the Queen's Hotel, Birmingham, at 7 p.m. "Fashioned in Steel" (illustrated by a colour film), by R. C. Benson.

Institution of Production Engineers (Glasgow Section):—Meeting at the Institute of Engineers and Shipbuilders in Scotland, 39, Elmbank Crescent, Glasgow, C.2, at 7.30 p.m. "Organizing for Quality Control," by R. H. S. Lesser.

OCTOBER 20

Mining Institute of Scotland:—Annual dinner and dance at the Central Hotel, Gordon Street, Glasgow, at 6.30 for 7 p.m.

Newport and District Metallurgical Society:—Annual dinner at the King's Head Hotel, Newport, at 7 p.m. Guest of honour: Sir Cyril Musgrave, chairman of the Iron and Steel Board.

OCTOBER 23

Institution of Production Engineers (Derby Section):—Meeting at the St. James's Restaurant, St. James's Street, Derby, at 7 p.m. "Spark Machining as an Aid to Production," by S. V. Divers.

Institution of Mechanical Engineers (East Midlands Branch):—Meeting at the College of Technology and Commerce (Room 104), Leicester, at 7.15 p.m. Repetition of James Clayton Lecture: "Machine-tool Research, Design, and Utilization," by D. G. Galloway.

National Association of Colliery Managers

OCTOBER 16

Midland Branch:—Meeting at the West Notts Technical College, Mansfield, at 6.30 p.m. "Staffing the Industry to Meet Today's Problem," by N. Gee, industrial relations director, East Midlands Divisional Coal Board.

OCTOBER 17

Yorkshire Branch:—Meeting at Kellingley Colliery at 3 p.m. Visit to the new mine, followed by presidential address by F. Fairclough.

OCTOBER 20

South Midland Branch:—Annual dinner and dance at the King's Head Hotel, Loughborough. Principal guests: A. E. Hiscox, national president, and H. S. Stephenson, HM Divisional Inspector of Mines and Quarries, East Midlands Division.

OCTOBER 25

Lancashire Branch:—Meeting at the Manchester Literary and Philosophical Society, 36, George Street, Manchester, at 4 p.m. R. H. Clough, HM Divisional Inspector of Mines, will introduce his report on the North Western Division for 1960.

OCTOBER 27

North of England Branch:—Annual dinner.

West Cumberland Metallurgical Society

PRESIDENT of the newly formed West Cumberland Metallurgical Society is Dr. V. W. Eldred (United Kingdom Atomic Energy Authority), who gave his presidential address last night (Thursday) at the Society's inaugural meeting at Whitehaven. The next meeting will be at the Primary School, Seascale, on November 9, when Prof. J. Nutting (University of Leeds) will give a paper on "Electron Microscopy."

Vice-president of the society is Mr. D. R. G. Davies (Workington Iron & Steel Company). Honorary secretary is Mr. L. H. Baxter, Department of Engineering and Metallurgy, College of Further Education, Park Lane, Workington.

THERMOCOUPLES for detecting temperatures in industry and research of up to 4,200 deg. F., are to be marketed by Honeywell Controls, Limited.

THE Hydraulic Plant and Machinery Group of the Institution of Mechanical Engineers plans to hold a conference on "Oil Hydraulic Power Transmission and Control" in London on November 29 and 30.

New Developments in Coal Production

TWO new technical developments connected with underground roof supports were seen by Mr. W. V. Sheppard, director general of production, National Coal Board, when he visited the works of Dowty Mining Equipment, Limited, at Ashchurch, near Tewkesbury (Glos), last week.

MR. W. V. SHEPPARD.

One new development involves the remote control by electrical means of hydraulically powered coal face support, and the second, and more recent, project provides for continuous support of roof and floor in coal working with power-operated hydraulic units. After watching a demonstration of the new equipment, Mr. Sheppard said that both projects would be energetically tried out in underground conditions as soon as possible, as a joint effort by the Dowty group and the National Coal Board. He congratulated those concerned with the developments against the background of the NCB's drive to produce coal with maximum efficiency.

Mr. Sheppard was accompanied during his visit by Mr. A. W. Mills, managing director of Dowty Mining Equipment, Mr. H. Langford Holt, deputy managing director, and Mr. Gurney Thomas, a director of Dowty Technical Developments, Limited.

Scots Miners Face Dismissal

MORE than 250 miners are due to be dismissed this weekend for habitual early finishing at Polkemmet Colliery, Whitburn (West Lothian)—the colliery where more than 100 latecomers were sent home for a day recently. Mr. Thomas Smith, manager of the colliery, has already issued seven-day dismissal notices after repeated warnings about returning to the surface before the end of the 7¼-hr. shift.

A member of the colliery's branch committee of the NUM maintained that early finishing had been an accepted practice in the area for many years. He added that all the men who had been served with dismissal notices actually had "sick lines" issued by underground officials to allow them to return to the surface early. The committee is to challenge the dismissals and, following a meeting on Monday, decided to refer the matter to a disputes committee.

THE BONUS incentive scheme, proposed by British Railways, for the crews of freight trains, which is designed to speed deliveries of coal in the Midlands during the coming winter, has been referred to the railwaymen's unions for consideration next week. The scheme involves bonus payments for each hour of time saved on freight trips. British Railways are faced with the problem of moving an additional 500,000 tons of coal this winter and are hampered by an acute shortage of operating staff.

Mardy Colliery Half-way Towards Output Target

DURING the week ended September 16, 1961, Mardy Colliery, No. 4 (Aberdare) Area, South-Western Divisional Coal Board, reached the halfway mark by achieving a saleable output in five days of 10,021 tons. The final objective is an output of 20,000 tons a week. Closed in 1940, the colliery was the first in South Wales to be completely planned and reorganized by the NCB.

The manpower position generally in South Wales has had some influence on the slow build-up to the final complement of 2,400, the present number of men employed being 1,582. Nevertheless, in the week mentioned, the OMS at 28.95 cwt. is one of the highest in No. 4 Area, and the total weekly saleable output is only exceeded by three collieries in the South-Western Division.

Much of the success being achieved is due to modern power-loading machines on the faces, which, in the week in question, produced 57 per cent. of the output. The colliery is laid out on horizon mining principles, and the haulage on three horizons is by diesel locomotives. These machines not only bring the coal out but ride the men in to work.

FBI Entertains Delhi College Principal

PRINCIPAL of the Delhi College of Engineering and Technology, Mr. R. N. Dogra was present at the London headquarters of the Federation of British Industries on Tuesday, to meet Mr. P. F. D. Tennant, oversea director of FBI, and other representatives of British industry which has provided over £250,000 towards the equipment of the college.

The British Government is providing some 15 professors over periods of five years and a number of additional services, and Mr. Dogra said that he agreed with Prof. Humayun Kabir, Indian Minister for Scientific Research and Cultural Affairs, that India was fortunate in procuring the services of a dedicated band of teachers from Britain for the college. He was sure it would develop into one of the finest technological institutions in Asia.

The Government of India is providing the buildings and all other staff, services, and locally available equipment. The first group of 150 students are equally divided between the departments of civil, mechanical, electrical, and chemical engineering and textile technology.

Australia Looks to Greater Coal Exports

NEW port facilities are being established at Port Kembla, Australia, at an estimated cost of £A2,500,000 to enable coal to be taken on board colliers at the rate of 10,000 tons an hour and world-wide tenders for the supply of modern coal-handling equipment have been asked for. It is hoped to stimulate exports of Australian coal to Japan and other countries.

Deputy chairman of the New South Wales Coal Association, Mr. McCleaver, has forecast that 50,000,000 tons of coal a year will be shipped from Port Kembla, Sydney, and Newcastle, where coal-handling facilities are to be modernized, within two or three years of the completion of the new installations.

Security Scheme for Workers

STATE TRUST SUGGESTED TO END LABOUR DISPUTES

PLAN for a national security trust, set up by Act of Parliament, and financed from the profits of industry, with the aim of giving workers security and ending unofficial strikes, irresponsible demarcation disputes, ballot rigging, and restrictive practices, was put forward by Mr. I. M. Stewart, chairman of Thermotank, Limited, heating and ventilating engineers, in his presidential address in Glasgow last week to the Institution of Engineers and Shipbuilders in Scotland.

Mr. Stewart said that the TUC had no statutory power to enforce discipline and the unions were not inclined to take action. Some form of legislation seemed essential, not to stifle unionism but to give it a new financial independence, an atmosphere in which it could be free from inhibition and play a constructive role.

The broad essentials of his proposals would leave the TUC structure intact. An organization known as the National Security Trust or National Security Authority should be set up by Act of Parliament. Any union should have the opportunity of registering with the trust and so have the right to receive funds for union benefits, provided its general activities were in accordance with the conditions and codes of practice laid down in the Act.

Undertaking from Unions

Any qualifying individual, whether a member of a union or not, could register with the trust and for an annual fee receive specified benefits. For a trial period of, say, five years, a fixed percentage of industrial and commercial profits should be deducted annually from the taxes on profits collected by the Revenue from all commercial sources and transferred to the trust.

Ways and means should be devised in conjunction with the security trust, employers and other selected experts, of eliminating defects in our present wages system, said Mr. Stewart. Strikes, voting procedure, and restrictive practices must be defined so that there would be democratic procedure, acceptable arbitration, and right of appeal.

In return for a written undertaking that unofficial strikes, irresponsible demarcation disputes, ballot rigging and restrictive practices were ended, unions would get funds for such activities as craft scholarships and tuition and training in union service.

The proposed national pay structure would rationalize wages between industries and between grades of workers. Unions would become responsible to the nation in the same way that boards of directors were controlled by the Companies Act. Workers would get pensions, unemployment benefits, redundancy pay, and other services. As profits and productivity increased, so would the trust's funds, getting rid of the idea that there were two sides in industry and giving a common objective of higher profits.

Mr. Stewart said his proposals were no more revolutionary than the sale by the United States International Longshoremen's Union of their rule book of restrictive practices to the employers for about £10,000,000. They would contribute to our stability and competitive ability.

BTC and Westinghouse Contract

A REQUEST by the British Transport Commission nas been made to the Westinghouse Brake & Signal Company, Limited, to cease production of vacuum brake cylinders under its long-term contract. Westinghouse stated that the request had been made "owing to the curtailment of BTC's wagon-building programme and the fact that substantial stocks of vacuum brake cylinders are held by the Commission." The company's claim for compensation is being prepared and will be submitted to BTC at an early date.

A spokesman for BTC said the fitting of vacuum brakes to mineral wagons had been suspended because the heavier screw couplings which it was necessary to use in conjunction with this type of brake had proved unacceptable to traders and their staffs who used the wagons in private sidings. It was now considering the modification of the couplings or the use of an alternative type.

Only a few thousand of BTC's 350,000 mineral wagons had been fitted so far, he added, but it had sufficient brake cylinders in stock to fit "a large number of them." Because of this, and because orders for new wagons were lower than in recent years, it had been decided production would have to be stopped "for the time being."

Higher Profits for Tap & Die are Forecast

CHAIRMAN of the Tap & Die Corporation, Limited, Mr. D. G. N. Lloyd-Lowles, states that turnover is running at a rate "well in excess" of the corresponding period last year and profits should again be higher. The group had a cash deficiency of about £82,000 at May 31, 1961, and the directors have now decided, subject to market conditions, to raise necessary capital—to finance the overdraft, and provide for future expansion—by way of fixed interest securities.

A range of machine tools has been developed by the International Twist Drill Company, Limited, which joined the group last year, which are in great demand, and to enable the fuller exploitation of this division negotiations have been completed for the purchase of the machine-tool making division of Smart & Brown, Limited, Biggleswade, for a price not exceeding £310,000 to be satisfied by the issue of Tap & Die ordinary shares.

Appointments

New Assistant Managers at Cannock Chase Pits

TWO collieries in the Cannock Chase Area of the West Midlands Division of the NCB are having new assistant managers. Mr. J. H. HARVEY'S appointment at Hilton Main Colliery is with effect from October 1. He has been undermanager at the colliery since 1952 and was previously undermanager at West Cannock Colliery for 10 years. He entered the mining industry in 1922 and all his working life to date has been spent in the Cannock Chase Area. Mr. Harvey is an associate member of the Institution of Mining Engineers.

Appointment of Mr. C. RIGBY at Mid-Cannock Colliery is with effect from November 20. Since July, 1958, he has been undermanager at Highley Colliery in the South Staffordshire and Shropshire Area. Mr. Rigby worked at various pits in the Cannock Chase Area up to 1954, when he was appointed master sinker at the new Lea Hall Colliery. In 1957 he became acting undermanager at Hawkins Colliery. Mr. Rigby is a member of the National Association of Colliery Managers and an associate member of the Institution of Mining Engineers.

Mr. A. A. EVANS has been appointed sales manager of the capacitors and resistors division, Swindon, of the Plessey Company, Limited.

Mr. W. S. PERKINS has been appointed divisional executive (Rugby), of the transformer division of Associated Electrical Industries, Limited.

A Barnsley man who began work in the pits as a boy, MR. FRANK RAMSDEN, has been appointed manager of Wharncliffe Woodmoor (4 and 5 units) Colliery.

Mr. A. O'BOYLE has been appointed assistant engineer, blast furnaces, of the Appleby-Frodingham Steel Company, branch of United Steel Companies, Limited.

Mr. D. W. BROWN has been appointed northern area representative for its thermostat division by R. B. Pullin & Company, Limited, manufacturers of scientific instruments, etc., of Brentford (Middx).

In succession to Mr. W. M. Gladwin, who has retired, Mr. G. D. PAUL has been appointed chief inspector for Steel, Peech & Tozer, branch of the United Steel Companies, Limited, Sheffield.

Joint responsibilities of technical and sales manager of the Brockhouse group of companies has been taken over by Mr. A. BROADMAN. Mr. F. V. BIRD has joined the group as technical sales engineer.

Mr. J. D. SWALLOW has been appointed advertising manager of the UK divisions of the Yale & Towne Manufacturing Company, manufacturers of locks, builders' hardware, and materials handling plant.

Mr. DOUGLAS FOWLER, organization and methods officer of Brookhirst Igranic, Limited, has been appointed works manager of Avo, Limited. Both companies are members of the Metal Industries Group.

The Council of British Manufacturers of Petroleum Equipment has appointed Mr. R. A. PITTMAN as deputy director, a new position which the council's increasing membership and activities has rendered necessary.

Mr. J. H. CALLAGHAN has been appointed sales manager for B. & S. Massey, Limited, manufacturers of forging and drop plant, of Manchester, in succession to Mr. D. L. Perry, who has retired after 48 years with the company.

Manager of the central engineering workshops at the United Steel Companies' Workington Iron & Steel Company branch, Mr. R. G. MONKHOUSE, has been appointed works manager (Ickles) at the Steel, Peech & Tozer branch. He will take up his new post on November 1.

Mr. A. C. JONES has been appointed an assistant general manager within the automatic control valves group of Elliott Bros. (London), Limited, manufacturers of instrumentation and automatic control equipment, of London, S.E.13, a member of the Elliott-Automation, Limited, group.

Birmingham University has elected Mr. A. W. KWIATKOWSKI to be Lecturer in the Department of Mechanical Engineering, Dr. R. B. SHEARN to be Lecturer in the Department of Chemical Engineering, and Mr. N. B. W. THOMPSON to be Lecturer in the Department of Physical Metallurgy.

Assistant general works engineer of Leyland Motors, Limited, for the last six years, Mr. R. A. WIGGINS has been appointed general works engineer of the company. He succeeds Mr. F. GRIMSHAW, who held the position for many years, and who will in future act as consultant to the company on development projects.

Mr. DESMOND AMBROSE, who was until recently manager of the laboratory engineering department of Automatic Control Engineering, Limited (a subsidiary of Constructors John Brown, Limited), has been appointed manager of the southern division of Fischer & Porter, Limited, manufacturers of flowmeters and process control instruments, of Workington (Cumberland). A previous report issued to the Press erroneously described Mr. Ambrose's former appointment.

Brora Pit to Reopen with Miners Part-owners

OLDEST coal mine in Britain, Brora Colliery, Sutherland, which closed last April as a result of the liquidation of the operating company, the Brora Coal & Brick Company, Limited, will reopen on Tuesday and the 25 miners who lost their jobs will start work there again, but this time as part-owners as well as workers.

The colliery has been purchased by the Highland Fund, Limited, from the liquidator, and sufficient capital has been made available to the new company, Highland Collieries, Limited, formed jointly by themselves and the miners, to purchase the assets and restart operations.

By agreement, each miner will take out of his weekly pay two shares of 5s. each and will receive a dividend at the end of the year after the Highland Fund has been paid a nominal interest of 3 per cent. and provision has been made for repayment of capital, depreciation, and the normal charges. It is estimated that on an annual output of 8,000 tons, the miners will be able to own the pit themselves in five or six years.

The board of the new company will be as follows:—Chairman, Mr. J. M. Rollo (chairman of the fund); Mr. James A. Cuthbertson (vice-chairman of the fund); Mr. A. Macneill Weir (member of the fund council); Mr. John B. Hume (former manager of the colliery); Mr. Donald Gregory (former deputy manager); Mr. William Dunn (a miner elected by his colleagues).

Coal mining at Brora goes back 400 years and the present pit was sunk in 1810. At an extraction rate of 8,000 tons a year it is estimated that the reserves will last 15 years, but another seam, 200 ft. deeper is believed to contain about 13,000,000 tons of coal.

IRON AND STEEL TRADE

SLIGHT improvement in the demand for heavy sections and joists is being maintained, but the extra tonnage on order is insufficient to bring back into production the steel furnaces which have been laid off, or to restore full-time working at blast furnaces and rolling mills. Minor fluctuations in demand are expected in the next few months, but no material improvement in the situation is foreseeable. This is borne out by the decision of the Appleby-Frodingham Steel Company, branch of United Steel Companies, Limited, to suspend work on a major part of its development project.

Pig-iron

Although the level of demand is much lower than capacity could cope with, the call for the low phosphorus irons by the engineering and speciality foundries is maintained at a fairly reasonable level. There is plenty of hematite and refined iron available and the demand for high phosphorus iron is well below the quantities which could be supplied.

Similarly, production of basic pig-iron for the steelworks could be stepped up considerably if the need warranted it. Fairly substantial quantities are being exported.

Ferro-alloys

Interest in ferro-tungsten is quiet, but ferro-molybdenum and ferro-vanadium receive steady attention. The major grades of ferro-silicon are moderately supported and ferro-chrome is of fair interest. There is a good demand for calcium-silicide and ferro-manganese, and in more specialized directions, there is a good demand for ferro-phosphorus and ferro-sulphide.

There is a steady call on ferro-titanium, while the demand for ferro-niobium has settled at a lower level.

Semi-finished Steel

A reduced number of shifts is reported from many of the re-rollers as business arising is no more than moderate. Trade in reinforcing rods and bars is one of the more cheerful aspects, but the demand for small bars, strip, etc., still lags well behind capacity and makes planning rolling programmes a constant headache.

Arisings at the steelworks of suitable re-rolling quality defectives and crops are being taken up.

Finished Steel

Consumers are still only buying from week to week to meet current needs and very few makers have sufficient tonnages booked to give them any idea of forward needs. Makers of strip and sheet, particularly, are finding it exceptionally difficult to maintain production at anything like an economic level.

The call for flat and corrugated galvanized sheets is reasonably well maintained and the engineering trades are indenting steadily for the special alloy and high carbon steels, but an acute shortage of orders is reported by the makers of bright drawn bars. There is a slight but very welcome improvement in the call for colliery requirements.

RALPHS ENGINEERING COMPANY, LIMITED, Leicester, whose export trade to Germany has expanded considerably during recent years, is to open up a German subsidiary to be known as Ralphs Shuhmaschinen, GmbH.

Sheepbridge Blast Furnaces to Close Down

FIVE hundred men are to lose their jobs at the Sheepbridge Company, Limited, Chesterfield, Derbyshire, when the blast furnaces close down next month. This was revealed by a spokesman for the company last Friday. The firm's total labour force is 700 and only 200 will be retained. The main reason for the redundancy is a big drop in demand for basic iron, the chief products of the firm's blast furnaces.

The spokesman explained: "This serious step has been forced on us. The steel industry, our main customer, has progressively increased its own production of basic iron, in integrated steel plants. This means it is not ordering the iron from us. The position is aggravated by a second factor—that the steel industry is also undergoing a decline in its own products which reduces the need for basic iron."

Employees' pension rights are to be safeguarded, compensation paid, and men helped to find other work. Sheepbridge, which is a subsidiary of the Staveley Iron & Chemical Company, Limited, and a member of the Stewarts and Lloyds group, hopes to be able to continue production until November 17.

£350,000 Extensions at Murex Works

EXTENSIONS costing £350,000 have recently been completed at the Waltham Cross (Herts), works of Murex Welding Processes, Limited, manufacturers of welding plant, etc. The new buildings consist of a 500 ft. long single-storey production shop with a floor area of 62,000 sq. ft. for the manufacture of electric arc welding plant and a two-storey office block of 7,200 sq. ft. to accommodate the plant sales department, drawing office and works engineer's department.

The extensions are required to meet the increasing demand for the company's metal arc welding electrodes and equipment both at home and oversea.

FOLLOWING the financial strengthening of the company, the General Steel & Iron Company, Limited, engineers and steel stockholders, of Hayes (Middx), states that it can now provide improved service and facilities as a result of the purchase of a wider range of stocks and new equipment for handling and processing material. A sales office is shortly to be established at 30/32, Mortimer Street, London, W.1, and customers will be advised of telephone and telex numbers in due course.

Coalfield News

Another Record for Cannock Chase

MINERS in the Cannock Chase Area of the West Midlands Divisional Coal Board continue to boost production. Last week they achieved an output per manshift of 111.5 cwt.—nearly 8 cwt. more than the top figure reached a fortnight earlier.

In the division as a whole, OMS was 99.6 cwt., nearly 1 cwt. higher than the previous best which was recorded in May.

DAMAGE ESTIMATED AT £20,000 was caused by fire at the NCB maintenance depot at Comrie Castle, Blairhall (Fife), on Thursday of last week.

MR. ARTHUR E. BARON has retired after 50 years in the mining industry at Esh and Ushaw Collieries, Co. Durham, the last seven as deputy overman.

DECISION TO SUSPEND operations at Moorhill Drift is announced by the Durham Divisional Coal Board. Arrangements have been made to transfer the 23 workmen concerned to other pits in the area.

VERDICT of Accidental Death was recorded at an Abertillery (Mon) inquest on Mr. Alfred Frank Watkins (59), a miner, who died after being struck on the head by a falling stone at Cwmtillery Colliery.

COAL SHIPMENTS through the port of Garston, Liverpool, totalled 57,679 tons in September. Coke shipments amounted to 1,642 tons. Principal coal shipments were to Northern Ireland (47,379 tons) and Eire (6,543 tons).

A MILK BOYCOTT has been started by 1,650 miners at Cwm Colliery, near Pontypridd, because the price of milk sold in the canteen has been increased by 1d. a pint. The NCB states that the increase is a service charge.

COAL AND COKE shipments from the South Wales ports were less last week. At 59,935 tons they showed a reduction of 7,742 tons, compared with the preceding seven days and were 23,482 tons down on the level reached a year ago.

IN THE 39th week of the year, overall productivity in the Durham Division again exceeded 23 cwt. per manshift. The average was 23.43 cwt., compared with 22.84 cwt. in the same week last year. At the face, productivity reached 65.56 (65.18) cwt.

UNIT ELECTRICAL ENGINEER at Morton Colliery, near Derby, for the past four years, Mr. H. Holden recently received a presentation from colleagues when he left the pit for a new post. He is now unit electrical engineer at Whitwell Colliery, near Worksop.

DAMAGE ESTIMATED at between £25,000 and £30,000 was caused at the siding at the coal preparation of Grimethorpe Colliery (Yorks) last week when a train of 27 loaded coal wagons got out of control, fouled a set of points, crashed into stationary wagons, telescoped and turned over.

A START is to be made—a few weeks ahead of schedule—on winding Hanley Deep Pit coal up the new shaft at Wolstanton Colliery. This is the latest development in the three-pit concentration scheme centred on Wolstanton. The first tonnages from Sneyd are expected to be wound at Wolstanton in the spring.

WORKING AT Westerton Colliery is to cease on October 28. Announcing this, the Durham Divisional Coal Board states that negotiations are being held with lodge representatives for placing the 36 workmen involved in the closure at nearby collieries. The transferred men will make good losses incurred due to wastage at the receiving collieries.

GRAIG FAWR COLLIERY, Newbridge (Mon), ceased production on Saturday because of the exhaustion of realistic coal reserves. The South-Western Divisional Coal Board states that opportunities of employment at neighbouring collieries have been provided for all the 150 men working at the colliery towards the end of its existence, and no redundancy arises.

ANOTHER 100 MINERS are to be transferred from West Sleekburn Colliery (Northumberland) to other pits in the vicinity, on October 30, after which only 250 men and boys will be working at the colliery. About 12 months ago, it was decided to introduce one-shift working at West Sleekburn, and it is expected that the pit will be finally closed in March next year.

EXCAVATIONS on an open-cast mining site at Gildersome, near Leeds, have revealed what is thought to be part of a tree between 50,000,000 and 200,000,000 years old. The tree was found in a seam of coal, and the bark has turned to coal. It has been examined by Dr. Harold Smith, a National Coal Board botanist and Mr. Ernest Bradburn, of the Coal Survey Laboratory. Scientists from the University of Leeds estimate the tree was 14 in. in diameter.

DURHAM DIVISIONAL COAL BOARD has asked Sunderland Corporation to build a housing estate for miners at the north end of the city, to accommodate about 600 extra miners who will be needed at Wearmouth Colliery. The board is spending £5,000,000 on developments at Wearmouth and by 1967, production at the pit should be doubled to 1,000,000 tons annually. About 2,500 miners will be employed. The board has offered to provide the necessary land.

COSSALL COLLIERY, representing Area No. 5 (Ilkeston) of the East Midlands Division of the National Coal Board won the division's annual Civil Defence competition on Saturday. It will represent the division in the NCB's national competition next June and at the National Industrial Civil Defence Competition. Second and third were Thoresby Colliery, representing No. 3 (Edwinstowe) Area and Bestwood Colliery, representing No. 6 (Nottingham) Area, respectively.

A VOUCHER WORTH £30, exchangeable for domestic goods, is a prize that 51 safety conscious workmen employed by the Durham Divisional Coal Board can win over the next few weeks. Prize draws to decide the winners are being held in various parts of the coalfield. Those eligible are colliery under-officials and workmen at collieries and cokeworks who have been compensable accident free (*i.e.*, free from accident involving absence from work for a period exceeding three days) from July 3 to September 30 this year.

Saturday Work for East Midlands Miners?

IT was made known on Wednesday that all Derbyshire's 34,000 miners at 44 pits are to be asked if they will work on the six Saturdays before Christmas. The National Union of Mineworkers has decided because of new circumstances, that selected pits throughout the country should have the chance of Saturday work.

Chairman of the East Midlands Divisional Coal Board, Mr. W. L. Miron, said, "It has been decided to ask all pits in the Division if they would like this work, because the East Midlands produces mainly the large and graded type of coal that is specially required." The question is to be considered at a further metting of Nottingham Area Council of the NUM.

THE COAL TRADE

STOCKS of house coal in merchants' yards—at 2.3 weeks' supply, compared with 1.8 weeks' supply a year ago—bear witness to the intention of the National Coal Board and the trade, declared earlier this year, to get as much coal as possible away from the pithead. In some districts consumers, too, appear to have stocked up better than they did a year ago. Nevertheless, shortages of popular qualities make the fulfilment of particular orders difficult, and the trade is not without anxiety when it is remembered that colliery stocks of house coal are down on last year. Industrial tonnages come forward satisfactorily on the whole, and manufacturers' stocks are comfortable.

DURHAM AND NORTHUMBERLAND

Although an assurance has been given that supplies of smokeless, processed domestic fuels will be adequate, current demand is already exerting pressure on supplies and the full seasonal demand has yet to be experienced. This does not apply to cokes, which are plentiful. Solid fuel central heating has made encouraging progress following recent and present campaigns and demand for smokeless varieties will no doubt show further expansion.

There is sustained demand, both regionally and coastwise, for superior large and graded sizes of Durham and Northumberland steams for domestic use, and it is hoped that resumption of the Saturday shift at selected pits will help to meet what is expected to be an expanding demand in the winter months. However, deferment of the ending of summertime may possibly retard the normal rise in this demand.

Greater activity in the iron and steel industry is scarcely reflected in the demand for Durham industrial cokes and coking coal; supplies of industrial coke are adequate to meet any progressive improvement. Durham gas coal continues to show more seasonal activity. Coal exports are rather higher than a year ago.

SOUTH WALES

Swansea—The demand for house coal is being maintained at a reasonable level. Supplies from the collieries to merchants are sufficient to enable orders to be delivered fairly promptly, except when the consumer states a preference for Group 3, a grade still very scarce.

Group 1 anthracite of all sizes is scarce and most merchants have given up hope of starting the winter with any sort of stock behind them.

With the start of the central heating season more interest is being shown in coke and dry steam cobbles, and supplies of dry steam nuts are moving steadily. A steady demand is also being maintained for industrial fuels.

No More Coal Through Grimsby

COAL shipments from Grimsby, which have taken place for more than a century, are to cease at the end of the year owing to a decline in trade. During recent years, shipments have been gradually declining and they would have ended last year but for urgent requests from coal shipping firms for them to continue.

Much of the coal in past years has been shipped from Yorkshire pits through Grimsby to London electricity generating stations, a trade now practically ended because of the advent of oil.

Coal's 4·2 Per Cent. Drop in Manpower

DECLINE in manpower in the coal industry, which during the holiday period became no more than the normal wastage expected in any large undertaking, has risen again and in the week ended September 30 dropped by 530 to 562,930. There were 120 fewer face workers. This represents a drop of over 25,500 overall and over 11,000 at the face in the past 12 months, or 4.2 and 5.4. per cent., respectively.

Less coal (17,200 tons) from open-cast sources accounted in the main for the drop in total output last week of 25,000 tons to 3,871,000 tons. However, this is still well above the average for the year (3,600,000 tons), and the average for the first 40 weeks of 1960 (3,700,000 tons).

Undistributed stocks are almost static at about 22,360,000 tons—34,400,000 tons a year ago—and consumers now have almost 17,000,000 tons in stock, compared with 14,000,000 tons this time last year.

There were 562,930 wage-earners on colliery books on September 30, against 588,480 on October 1, 1960, the numbers engaged at the coal face being 210,960 and 223,000 respectively. Total absenteeism (all workers) in the week ended September 30 was 15.30 per cent., compared with 14.88 per cent. in the week ended October 1, 1960. Output at the face was 4.228 tons and overall 1.479 tons in the week ended September 30, compared with 4.012 and 1.413 tons in the week ended October 1, 1960.

The following table gives (in tons) the provisional figures of output of saleable mined coal by division in the week ended October 7, and the tonnage lost through disputes:—

Division.	Week ended October 7, 1961.		Week ended October 8, 1960.
	Total output.	Tonnage lost.	Total output.
Scottish	325,000	35,000	334,000
Northern (N&C)	240,000	—	246,000
Durham	454,000	1,000	467,000
North-Eastern	819,000	1,000	821,000
North-Western	247,000	1,000	265,000
East Midlands	904,000	1,000	874,000
West Midlands	285,000	—	262,000
South-Western	364,000	5,000	372,000
South-Eastern	28,000	—	31,000
Great Britain—			
Deep-mined coal	3,666,000	44,000	3,672,000
Open-cast coal	162,000	—	133,000
Other deep-mined (including licensed mines)	43,000	—	41,000
TOTAL	3,871,000	44,000	3,846,000

Orders Placed

Turbo-generators for Australia

TURBO-GENERATORS and associated plant worth over £1,000,000 are to be supplied to Australia by C. A. Parsons & Company, Limited, Newcastle-upon-Tyne. The State Electricity Commission of Western Australia has ordered from Parsons two 60,000 kW steam turbo-generator sets together with condensing and feed heating plant, for installation in the new Muja generating station, situated on an open-cast coalfield near Collie and not far from Bunbury power station where four 30,000 kW turbo-generators of Parsons manufacture are now running.

These new sets will run at 3,000 r.p.m. and incorporate turbines of the two cylinder design. They will operate with steam conditions of 900 lb./sq. in. pressure and 900 deg. F. temperature. All the condensing and feed heating plant will be manufactured at Parsons Whyalla works, South Australia.

GWYNNES PUMPS, LIMITED, Lincoln, have received an order valued at about £325,000 from the Central Electricity Generating Board for circulating water pumping equipment for the new West Burton power station.

CONTRACT WORTH about £300,000 for the major part of the electrical equipment in a new pulp and paper mill to be built in Yugoslavia has been awarded to the English Electric Company, Limited, by Millspaugh-Wimpey, Limited.

THE General Electric Company, Limited, has received an order from the Reed Paper Group for a 5 mW passout geared turbo-generator and the associated condensing plant, valued at approximately £125,000. The condensing plant will be manufactured by Hick Hargreaves & Company, Limited.

BELIEVED TO be the largest order ever obtained by a Scottish ironfounder, Carron Company, Falkirk, has secured a £2,000,000 contract for the supply of segment castings for the Jarrow-Howden tunnel under the River Tyne. The contract will take three years to complete and the firm is expected to employ additional labour.

WORTH OVER £1,500,000, Scottish Cables, Limited, a member of the British Insulated Callender's Cables, Limited, group, has secured its record contract for 900 miles of cable for the South of Scotland Electricity Board. The order covers the board's annual requirements for underground mains cables and the associated supervisory and control cables.

EDWIN DANKS & COMPANY (OLDBURY), LIMITED, a subsidiary of Babcock & Wilcox, Limited, has secured in collaboration with two American design organizations, the main contract for the supply of a gasoline plant and associated wellhead equipment to Yugoslavia. Total value of the contract is over £1,000,000 and most of the material will be supplied from UK sources.

TOTAL VALUE of work being carried out by the Mitchell Construction Company, Limited, Peterborough, on the West Burton power station project, near Gainsborough (Lincs), has been raised to £1,250,000 by the £175,000 contract for additional work which has just been awarded to the company by the Northern project group of the Central Electricity Generating Board.

FURTHER CONTRACTS have been awarded for the mechanized marshalling yard being built at Healey Mills by the North-eastern region of British Railways. British Insulated Callender's Cables, Limited, is to supply 50 miles of multi-core control cable and 15 miles of 2-core power cable for use with the main technical equipment. K.S. Construction, Limited, Leeds, will instal lighting equipment.

THE South Durham Steel & Iron Company, Limited, has been awarded a contract by the Kuwait Gas and Electricity Board for the supply of 55 miles of 24-in. and 26-in. diameter steel pipes in 40-ft. lengths for the conveyance of fresh water to the town of Kuwait. The value of the contract is approximately £725,000 and the pipes are for delivery in Kuwait by the end of this year. This contract has been secured by the South Durham Company in the face of fierce competition from continental and Japanese pipe producers. The pipes will be manufactured at the company's steel pipe plant at Stockton-on-Tees.

More Space for Super Oil Seals & Gaskets

SPEAKING at a luncheon in Cardiff last week to mark the opening of the new factory of Super Oil Seals & Gaskets, Limited, at Llanishen, the Minister of State for Welsh Affairs, Lord Brecon, said that although it was sad to see some of the old works closing down, they must pin their faith to modernized industry if Britain was to hold its place in the world.

He refuted suggestions that some Midland firms which had gone to Wales were unhappy about the move. It was not the general experience and South Wales could boast of a better record for labour relations than anywhere else in the country.

The company, which leased a Government-built factory in Cardiff in 1951, has moved to the site of the old Royal Ordnance Factory at Llanishen. Productive capacity which increased five times between 1952 and 1960, can now be expanded 10 times and, when in full production, the plant will be one of the biggest high-pressure hose manufacturing units in Europe.

Government Praise for Scottish Firms

TWO more Scottish firms, Butters Bros. & Company, Limited, engineers and manufacturers of cranes, of Glasgow, and Brown Bros. & Company, Limited, hydraulic engineers and brassfounders, of Edinburgh, were congratulated on Monday by Government representatives on their export achievements. Mr. Gilmour Leburn, Joint Under Secretary of State for Scotland, passed the congratulations of the President of the Board of Trade to Mr. Willis Butters, managing director of Butters Bros., on the fine performance the firm is putting up.

The Earl of Dalkeith, MP for North Edinburgh, visited Brown Bros. works and conveyed the Government's appreciation of the company's export record and saw some of the results of the £300,000 modernization scheme, which the firm hopes will further increase oversea trade.

GEEVOR TIN MINES, LIMITED—Mr. D. H. Batchelor, mine manager, has been appointed a director in succession to the late Mr. J. H. Bennetts.

The Scrap Markets

IN THE DOLDRUMS

Resumption of Scrap Exports Possible

WITH steel production running at well below rated capacity the intake of scrap iron and steel by consuming works in the UK is currently at a very low level indeed. Scrap merchant processors are delivering material on a very severe allocation basis to steelworks and blast furnaces. A merchant must adhere strictly to the tonnage allocated to him. Where excessive deliveries are made the merchant concerned has his next week's allocation reduced and may be stopped from sending in material for a further week.

Many of the smaller dealers throughout the country are finding it extremely difficult to operate and action will be called for at the annual meeting of the National Federation of Scrap Iron, Steel & Metal Merchants, which takes place in London on October 19.

A deputation from the National Scrap Federation is understood to be meeting representatives of the British Iron and Steel Federation and the Iron and Steel Board during the coming week with a view to reopening the export trade in scrap which is clearly not required by British consumers. If exports are allowed, it will presumably be for No. 4 and 5 bundles, which are the most difficult grades to move at the present time. Trade in cast-iron scrap is not too difficult, although here again deliveries are on an allocation only basis.

Reports from Areas

Cleveland—The steelworks and ironfoundries are restricting their intake of fresh scrap material as their stocks are already high and outputs well below capacity. Foundries are steadier in their consumption of short heavy steel and good class machinery and other grades of cast-iron scrap, but here too the outlets are not so numerous.

Some scrap firms are making up on the export of second half sections, plates, and rails to Japanese and Far Eastern customers, but generally speaking a quiet tone prevails.

South Wales—Merchants are encountering more and more difficulties each week. Steelmakers and ironfounders have sufficient supplies of scrap on the ground to meet their requirements, and labels are not being issued. Merchants' expenses continue, however, as they wish to maintain their normal working routine, but at the present moment the market is very quiet.

With the closing last week of another local steelworks the position is even more discouraging; merchants feel, justifiably, that the present closure policy is going to have far-reaching effects.

Scotland—Business throughout Glasgow and the West of Scotland is on a very restricted basis. The steelworks are continuing to operate a very rigid quota system and are in fact holding very strictly to the tonnage which they allocate weekly to each supplier. Merchants are finding it extremely difficult to meet the present market conditions, as their suppliers are continually pressing them for additional permit labels.

The output of steel turnings is still fairly high and the disposal of this grade of scrap is proving a headache to local merchants. The production of cast-iron borings is well maintained and it is pleasing to record that there are no restrictions on this class of traffic.

There has been a slight drop in the demand for cast-iron scrap and it is to be hoped that the position at the foundries will not follow in the same way as that of the steelworks. The position is not yet serious as the parcels arising are fairly readily disposed of.

Sunderland Crane Makers' Expansion

CURRENT programme of development and expansion of the Steel & Company, Limited, group of companies is due for completion in the autumn of next year, by which time the Crown Works at Sunderland "will be indisputably the world's largest mobile crane factory and production potential will have increased by 50 per cent."

The programme is designed to enable the group to maintain its activities in the home crane market and also to increase its European business and intensify counter-measures against continental suppliers in oversea markets. Extra machine tools costing approximately £500,000 are being installed at the Crown Works. The flow-line method of production—thought to be unique in the crane industry— is being extended, and greater use is being made of the latest value analysis techniques to lower costs without reducing quality.

The group's range of cranes—the largest in the world —has just been extended by the introduction of the Coles Leda, a fast-travelling, full-circle slewing mobile crane of 4 tons lifting capacity.

BCAC's First Annual Meeting

AT the first annual meeting of the British Conference on Automation and Computation at the Institution of Electrical Engineers last week, Sir Walter Puckey, chairman, recalled that some 12 months ago the BCAC had been reconstituted in its present form, and then presented the report of the executive committee on the year's work. This was approved, and in particular the setting up of informal panels of experts concerned respectively with education and training, foreign relations, public relations and research and development, was endorsed.

Law Cases

Steel Re-rollers Sue Employee

IN what is believed to be the first case of its kind in the Midlands, steel re-rollers John Bradley & Company (Stourbridge), Limited, brought an action at Stourbridge Court under the Employers and Workmen's Act of 1875 claiming £10 compensation for losses caused by the unexplained absence of an employee, Mr. Maurice Parry. The magistrates dismissed the action but refused to award Mr. Parry costs.

The managing director of the firm Mr. E. T. Elwell, said that Mr. Parry was employed on an essential and skilled job of bolter-down in the rolling mill team. He stayed away for two shifts, one in the day and the other at night, and there was a loss of production each time of 12 to 15 tons of steel. The rolling mill was stopped and the other operators in the team were made idle. When asked for an explanation of his absence Parry had failed to produce one.

In his evidence Mr. Parry said that at one time there had been allowances if one operator did another man's job. He could remember the rolling mill being kept in production when two men were missing from a team. The reason why he absented himself was that he did not feel up to doing a dangerous job which needed some agility. There was no means of getting a message to the works at the time the shifts started.

For the defence Mr. P. B. Dillon said "This is a test action which is being brought by the company against one of its employees. If you find against Mr. Parry it would mean that more actions of this kind would be brought against the employees of this firm and they would be forced to defend them." He maintained there had been very little negotiation between the firm and the employees.

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The plaintiff complained that the company failed to take the proper recognized precautions to protect him from silica dust and that he developed tuberculosis, to which he had become more susceptible, because of the injury done to his lungs by the pneumoconiosis.

In his judgment, Lord Kilbrandon rejected a contention by the defendants that the plaintiff's incapacity was due to tuberculosis contracted before his pneumoconiosis and unconnected with it. On the medical evidence, which was not contradicted, the tuberculosis must fairly be said to have been caused by the pneumoconiosis. The defendants were therefore liable to pay the plaintiff damages for his resulting disability.

Mr. Cringles was awarded £1,610 for loss of wages to date, £2,500 for continuing loss, £400 for pain and suffering, and £250 for the limitation of expectation of life.

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Lord Justice Sellers said that Mr. Kaluza's whole case was that his employers were to blame. Mr. Justice Hinchcliffe was not prepared to find negligence by the employers and he (Lord Justice Sellers) entirely agreed. Lord Justice Upjohn and Mr. Justice Diplock concurred.

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Mr. R. I. Threlfall, QC for the respondents said they consented to the making of the order and gave the appropriate undertakings.

THE Pressed Steel Company, Limited, was fined £20 at Neath for failing to securely fence a dangerous part of a machine at its Neath works. It was stated for the company that it had done much in the field of industrial safety.

A MINER, Mr. Arthur Wild (59), who claimed £400 from the National Coal Board after suffering injury to his ankle at Rossington Colliery, was awarded £30 damages and £74 16s. 4d. agreed special damages at Doncaster County Court.

THE "EXTRAORDINARY EASE" with which scrap metal can be disposed of in Sheffield, was taken into account by the court when fining Thomas Harry Ross (44), a stockyard foreman, who had pleaded guilty to two charges of stealing scrap metal at Sheffield. Ross was fined £25.

AFTER PLEADING GUILTY at Billericay Magistrates' Court, the Ford Motor Company, Limited, was fined £50 with £12 15s. 6d. costs for not having a secure guard on a power press at its Basildon factory. For the company it was stated that the machine had produced 3,000,000 radiators without accident.

DAMAGES OF £2,000 were awarded by a jury sitting with Lord Cameron in the Court of Session to Mr. John Anthony Cavaney, a shale miner, of Linlithgow. He sued his former employers, the Oakbank Oil Company, Limited, for £4,000, claiming that it was negligent and failed to provide him with a safe place of working at No. 1 Mine, Philipstoun. The firm denied liability.

ELECTING TO GO for trial at Glamorgan Quarter Sessions, William George Francis (47), a lorry driver, pleaded Not Guilty at Pontardawe to a charge of stealing 11 cwt. of scrap copper, worth £15, the property of the NCB, from Hendy Merthyr Colliery, Craigcefnparc. Francis, who was on contract with the NCB to buy scrap copper from the colliery, was stated to have been seen taking away a load after the time limit of 3.30 p.m.

Inquest Jury's Recommendation

AT the Alfreton (Derby), inquest on Mr. Michael Caton (61), a miner who was found dead near an underground conveyor belt at Brookhill Colliery, Pinxton, Nottingham, a verdict of Accidental Death was returned, the jury recommending more frequent underground inspection at the colliery.

The Chesterfield district coroner commented: "Had this man's machine been adequately fenced, this accident might not have happened." Representing the National Union of Mineworkers, Mr. William Baker, said: "I think this accident emphasizes the need for greater vigilance."

COMPANY NEWS

SERCK, LIMITED, radiators, engineers, etc., of Birmingham—Group profits dropped slightly to £1,040,308 (£1,073,038) and the dividend is held at 12½ per cent.

KEELAVITE HYDRAULICS, LIMITED—It is proposed to offer 80,000 £1 ordinary shares to holders of the £1 ordinary and of the 10s. "B" ordinary shares. Terms will be notified in due course.

G. D. PETERS & COMPANY, LIMITED, holding company for road, railway, and rolling stock engineers, etc., of Slough (Bucks)—An interim of 2½ per cent. is being paid in respect of 1961. A single payment of 5 per cent. was made for 1960.

THOS. W. WARD, LIMITED, manufacturers of coke, iron, steel, and machinery, etc., of Sheffield—Group net profit for the year to June 30, 1961, increased to £1,592,601 (£1,468,249) after tax of £1,356,597 (£1,352,165). Final dividend of 10 per cent. makes a total of 13¾ per cent., the same equivalent, adjusting for a one-for-one scrip issue, as for the previous year.

BOWTHORPE HOLDINGS, LIMITED—Negotiations to acquire a controlling interest in a company whose products are allied to those of a subsidiary have reached an advanced stage and an announcement should be made in the near future. The acquisition should largely restore the 1961 profit to the level of 1960. The interim dividend is maintained at 7 per cent.

J. P. HALL & SONS (HOLDINGS), LIMITED, manufacturers of pumps, of Peterborough (Northants)—The company incurred a loss of £19,573 in the year to June 30, 1961, compared with a previous profit of £17,945. In their interim statement in July, the directors said that no ordinary dividend would be recommended—in 1959-60 it was halved to 10 per cent.—and that a loss was expected.

TINSLEY ROLLING MILLS COMPANY, LIMITED—Final dividend of 12½ per cent. makes 17½ (same) per cent. for the year ended June 30, 1961. Lord Riverdale, the chairman, said that he considered the company had done extremely well considering the difficulties during the period. It had been the second best year in the company's history for profits before taxation and a record for the profit after taxation.

LUNT, COMLEY & PITT, LIMITED, fuel and fuel oil distributors, etc., of Brierley Hill (Staffs)—Profits from the distribution of fuel and oil were well maintained and the builders' merchants department, foundry division, and engineers' file section traded successfully. Given normal conditions the directors face the future with confidence. Group profit of £217,864 was well ahead of the £180,000 forecast and the dividend is 9 per cent., compared with 8 per cent. forecast.

LAKE & ELLIOT, LIMITED, steelfounders, etc., of Braintree (Essex)—The final dividend is 8¼ per cent. on capital increased by a one-for-three scrip issue, compared with the forecast maintenance of the previous 7½ per cent. on the increased capital for the year to 12½ per cent. on the increased capital for the year to July 31, 1961, against a 9⅜ per cent. equivalent. Group profits have more than doubled at £564,169 (£260,021) and, after tax, the net balance is increased to £263,808 (£117,385).

HILGER & WATTS, LIMITED, manufacturers of scientific instruments, of London, N.W.1—An agreement has been reached whereby the company will offer to acquire the whole of the issued 560,000 ordinary 4s. shares of W. Ottway & Company, Limited, manufacturers of scientific instruments, of London, W.3, on the basis of one Hilger & Watts ordinary 5s. share for every six ordinary shares of Ottway. The directors of Ottway have agreed to accept the offer in respect of their own holdings and will recommend acceptance by all other shareholders.

WILLIAMS & WILLIAMS, LIMITED, makers of metal windows, doors, etc., of Chester—Group net trading profit in the year to April 30, 1961, recovered to £227,084, compared with a previous loss of £21,935. Mr. S. R. Hogg, chairman, says that oversea, the dead wood has been cut out and the drain on the financial and manufacturing resources utilized for production sent oversea and never paid for, has come to an end. No dividends are recommended.

BARTON & SONS, LIMITED, manufacturers of tubing and conduit, of Dudley (Worcs)—Although group results to end-September are not so favourable as those achieved in the same period of 1960, the board states that indications are that for the full year they will be "reasonably satisfactory," but will not equal the record achieved last year. Interim dividend is maintained at 6 per cent. adjusting for a one-for-four scrip issue. Last year's total was equal to 16 per cent.

JOHN FOLKES GROUP, LIMITED, forgemasters and general engineers, of Birmingham—Referring to the future at the annual meeting, Mr. J. H. Folkes, chairman and managing director, said he thought that the growth of the group would continue during the next 12 months and that when profits are announced at this time next year, shareholders would not be disappointed. He added that turnover had increased from £4,000,000 to £5,500,000 in the period ended April 30, 1961. Net profit for the year, after tax, was £182,375 (£146,622)—a record.

CROSSLEY BROS., LIMITED, makers of locomotive, marine, and stationary type diesel engines, gas engines, etc., of Manchester—Since the close of the financial year the takeover of Furnival & Company, Limited, has been completed and another project for a product other than the parent's current manufactures is in an advanced stage of negotiation, states the chairman, Mr. H. D. Carter. The future is difficult to see as, in the short term, there is ever keener competition in export markets for a reduced volume of business, which means "an international dog-fight on price."

DOXFORD & SUNDERLAND SHIPBUILDING & ENGINEERING COMPANY, LIMITED—Although Mr. J. R. Gebbie, the chairman, is confident that in the long run the recent merger of the Doxford and Sunderland groups into the present company will prove of great benefit to stockholders, he takes a less optimistic view of the short term and predicts a further reduction in profits for the current year. He states that orders on hand will keep all the company's shipyards and engine works well occupied during the year and there are considerable orders on the books for the following year. He explains that with the intense competition at home and oversea, further considerable outlay will be called for in the next few years.

HORSELEY BRIDGE & THOMAS PIGGOTT, LIMITED, constructional engineers, bridge builders, ironfounders, etc., of Tipton (Staffs)—While not of the magnitude of the order-book which cushioned the company through the recession, the volume of unexecuted orders is very reasonable and will keep the undertaking fully employed for some months, but later contracts may have to be taken at fine profit margins, states the chairman, Mr. J. V. Sheffield. Group profit before tax in the

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THE Pressed Steel Company, Limited, was fined £20 at Neath for failing to securely fence a dangerous part of a machine at its Neath works. It was stated for the company that it had done much in the field of industrial safety.

A MINER, Mr. Arthur Wild (59), who claimed £400 from the National Coal Board after suffering injury to his ankle at Rossington Colliery, was awarded £30 damages and £74 16s. 4d. agreed special damages at Doncaster County Court.

THE "EXTRAORDINARY EASE" with which scrap metal can be disposed of in Sheffield, was taken into account by the court when fining Thomas Harry Ross (44), a stockyard foreman, who had pleaded guilty to two charges of stealing scrap metal at Sheffield. Ross was fined £25.

AFTER PLEADING GUILTY at Billericay Magistrates' Court, the Ford Motor Company, Limited, was fined £50 with £12 15s. 6d. costs for not having a secure guard on a power press at its Basildon factory. For the company it was stated that the machine had produced 3,000,000 radiators without accident.

DAMAGES OF £2,000 were awarded by a jury sitting with Lord Cameron in the Court of Session to Mr. John Anthony Cavaney, a shale miner, of Linlithgow. He sued his former employers, the Oakbank Oil Company, Limited, for £4,000, claiming that it was negligent and failed to provide him with a safe place of working at No. 1 Mine, Philipstoun. The firm denied liability.

ELECTING TO GO for trial at Glamorgan Quarter Sessions, William George Francis (47), a lorry driver, pleaded Not Guilty at Pontardawe to a charge of stealing 11 cwt. of scrap copper, worth £15, the property of the NCB, from Hendy Merthyr Colliery, Craigcefnparc. Francis, who was on contract with the NCB to buy scrap copper from the colliery, was stated to have been seen taking away a load after the time limit of 3.30 p.m.

Inquest Jury's Recommendation

AT the Alfreton (Derby), inquest on Mr. Michael Caton (61), a miner who was found dead near an underground conveyor belt at Brookhill Colliery, Pinxton, Nottingham, a verdict of Accidental Death was returned, the jury recommending more frequent underground inspection at the colliery.

The Chesterfield district coroner commented: "Had this man's machine been adequately fenced, this accident might not have happened." Representing the National Union of Mineworkers, Mr. William Baker, said: "I think this accident emphasizes the need for greater vigilance."

COMPANY NEWS

SERCK, LIMITED, radiators, engineers, etc., of Birmingham—Group profits dropped slightly to £1,040,308 (£1,073,038) and the dividend is held at 12½ per cent.

KEELAVITE HYDRAULICS, LIMITED—It is proposed to offer 80,000 £1 ordinary shares to holders of the £1 ordinary and of the 10s. "B" ordinary shares. Terms will be notified in due course.

G. D. PETERS & COMPANY, LIMITED, holding company for road, railway, and rolling stock engineers, etc., of Slough (Bucks)—An interim of 2½ per cent. is being paid in respect of 1961. A single payment of 5 per cent. was made for 1960.

THOS. W. WARD, LIMITED, manufacturers of coke, iron, steel, and machinery, etc., of Sheffield—Group net profit for the year to June 30, 1961, increased to £1,592,601 (£1,468,249) after tax of £1,356,597 (£1,352,165). Final dividend of 10 per cent. makes a total of 13¾ per cent., the same equivalent, adjusting for a one-for-one scrip issue, as for the previous year.

BOWTHORPE HOLDINGS, LIMITED—Negotiations to acquire a controlling interest in a company whose products are allied to those of a subsidiary have reached an advanced stage and an announcement should be made in the near future. The acquisition should largely restore the 1961 profit to the level of 1960. The interim dividend is maintained at 7 per cent.

J. P. HALL & SONS (HOLDINGS), LIMITED, manufacturers of pumps, of Peterborough (Northants)—The company incurred a loss of £19,573 in the year to June 30, 1961, compared with a previous profit of £17,945. In their interim statement in July, the directors said that no ordinary dividend would be recommended—in 1959-60 it was halved to 10 per cent.—and that a loss was expected.

TINSLEY ROLLING MILLS COMPANY, LIMITED—Final dividend of 12½ per cent. makes 17½ (same) per cent. for the year ended June 30, 1961. Lord Riverdale, the chairman, said that he considered the company had done extremely well considering the difficulties during the period. It had been the second best year in the company's history for profits before taxation and a record for the profit after taxation.

LUNT, COMLEY & PITT, LIMITED, fuel and fuel oil distributors, etc., of Brierley Hill (Staffs)—Profits from the distribution of fuel and oil were well maintained and the builders' merchants department, foundry division, and engineers' file section traded successfully. Given normal conditions the directors face the future with confidence. Group profit of £217,864 was well ahead of the £180,000 forecast and the dividend is 9 per cent., compared with 8 per cent. forecast.

LAKE & ELLIOT, LIMITED, steelfounders, etc., of Braintree (Essex)—The final dividend is 8½ per cent. on capital increased by a one-for-three scrip issue, compared with the forecast maintenance of the previous 7½ per cent. on the increased capital for the year to 12½ per cent. on the increased capital for the year to July 31, 1961, against a 9⅜ per cent. equivalent. Group profits have more than doubled at £564,169 (£260,021) and, after tax, the net balance is increased to £263,808 (£117,385).

HILGER & WATTS, LIMITED, manufacturers of scientific instruments, of London, N.W.1—An agreement has been reached whereby the company will offer to acquire the whole of the issued 560,000 ordinary 4s. shares of W. Ottway & Company, Limited, manufacturers of scientific instruments, of London, W.3, on the basis of one Hilger & Watts ordinary 5s. share for every six ordinary shares of Ottway. The directors of Ottway have agreed to accept the offer in respect of their own holdings and will recommend acceptance by all other shareholders.

WILLIAMS & WILLIAMS, LIMITED, makers of metal windows, doors, etc., of Chester—Group net trading profit in the year to April 30, 1961, recovered to £227,084, compared with a previous loss of £21,935. Mr. S. R. Hogg, chairman, says that oversea, the dead wood has been cut out and the drain on the financial and manufacturing resources utilized for production sent oversea and never paid for, has come to an end. No dividends are recommended.

BARTON & SONS, LIMITED, manufacturers of tubing and conduit, of Dudley (Worcs)—Although group results to end-September are not so favourable as those achieved in the same period of 1960, the board states that indications are that for the full year they will be "reasonably satisfactory," but will not equal the record achieved last year. Interim dividend is maintained at 6 per cent. adjusting for a one-for-four scrip issue. Last year's total was equal to 16 per cent.

JOHN FOLKES GROUP, LIMITED, forgemasters and general engineers, of Birmingham—Referring to the future at the annual meeting, Mr. J. H. Folkes, chairman and managing director, said he thought that the growth of the group would continue during the next 12 months and that when profits are announced at this time next year, shareholders would not be disappointed. He added that turnover had increased from £4,000,000 to £5,500,000 in the period ended April 30, 1961. Net profit for the year, after tax, was £182,375 (£146,622)—a record.

CROSSLEY BROS., LIMITED, makers of locomotive, marine, and stationary type diesel engines, gas engines, etc., of Manchester—Since the close of the financial year the takeover of Furnival & Company, Limited, has been completed and another project for a product other than the parent's current manufactures is in an advanced stage of negotiation, states the chairman, Mr. H. D. Carter. The future is difficult to see as, in the short term, there is ever keener competition in export markets for a reduced volume of business, which means "an international dog-fight on price."

DOXFORD & SUNDERLAND SHIPBUILDING & ENGINEERING COMPANY, LIMITED—Although Mr. J. R. Gebbie, the chairman, is confident that in the long run the recent merger of the Doxford and Sunderland groups into the present company will prove of great benefit to stockholders, he takes a less optimistic view of the short term and predicts a further reduction in profits for the current year. He states that orders on hand will keep all the company's shipyards and engine works well occupied during the year and there are considerable orders on the books for the following year. He explains that with the intense competition at home and oversea, further considerable outlay will be called for in the next few years.

HORSELEY BRIDGE & THOMAS PIGGOTT, LIMITED, constructional engineers, bridge builders, ironfounders, etc., of Tipton (Staffs)—While not of the magnitude of the order-book which cushioned the company through the recession, the volume of unexecuted orders is very reasonable and will keep the undertaking fully employed for some months, but later contracts may have to be taken at fine profit margins, states the chairman, Mr. J. V. Sheffield. Group profit before tax in the

year ended March 31, 1961, which included the company's 51 per cent. proportion of the loss in Mechans, Limited, amounted to £312,048 (£333,689).

SILENTBLOC, LIMITED, makers of anti-vibration devices, of Crawley (Sussex)—Turnover declined slightly in the year to May 31, 1961, while that of Andre Rubber Company, Limited, increased sufficiently to offset the parent company's decrease, with the result that the group profit showed a marginal gain. Besides the motor car industry, the group now supplies industries in other fields including general engineering aircraft, railways, textile machinery, shipbuilding, wharves and road building, says the chairman, Mr. B. H. Dullanty. In many cases the company absorbed increases in costs without any corresponding rise in selling prices.

BABCOCK & WILCOX, LIMITED, engineers, manufacturers of water tube boilers, mechanical handling plant, etc., of London, N.W.1—In reaching their decision not to pay an interim dividend for 1961, the directors state that trading results for the year to date have been affected by the low level of manufacturing activity in the earlier part of the year, by nuclear contracts, and by a number of major outstanding claims on contracts still under discussion. Longer term prospects have increased and the order book now stands at a higher figure than at any time in the past four years.

Head Wrightson Chairman on Common Market Challenge

CHAIRMAN and managing director of Head, Wrightson & Company, Limited, iron and steelfounders, etc., of Thornaby-on-Tees (Yorks), Sir John Wrightson said on Monday that the group was "vitally interested" in the possibility of Britain joining the Common Market and was well placed to meet the opportunities it presented. "I regard it as a challenge and a most interesting development," he continued.

"Our products will become more and more specialized and allied to the highly industrialized countries of Western Europe. We believe the type of equipment we shall sell in the area will be more sophisticated than traditional." Sir John said that although the group had a full order-book, delivery times were tending to come down. This was because raw materials and semi-finished products were now available as and when required.

Fall in ICI's Half-year Profits

GROUP income, before tax, of Imperial Chemical Industries, Limited, in the first half of 1961, fell to £36,700,000 from £50,200,000, and after tax of £16,300,000 (£23,000,000), the net income was £20,400,000, against £27,200,000. The board states that home turnover was about 2¼ per cent. below the corresponding period of 1960, wholly due to reduced selling prices, the physical volume being about the same as the record achieved in the first half of 1960.

ICI exports from the UK for the first half of 1961 were worth £49,000,000, compared with £47,300,000 for the first half and £49,300,000 for the second half of 1960. The physical volume of exports was a new record, but markets for products from some of the oversea manufacturing subsidiaries were depressed. The decrease in income for the first half of 1961 was mainly due to reduction in selling prices and increases in wages and salaries.

Obituary

The death took place last week of Mr. JOHN HYND GRAHAM, managing director of Galvanizers, Limited, Scotstoun, Glasgow.

The death occurred last Saturday at the age of 39 of Mr. ROBERT LESLIE IRELAND, quality adviser to the steel division of the Steel Company of Wales, Limited.

A memorial service was held last Friday at Oakenshaw, near Bradford (Yorks), for Mr. HAROLD W. RIGBY, chairman of John Rigby & Sons, Limited, wire manufacturers, of Bradford, who died while on holiday in France and was cremated in Paris.

Former managing director of the Birmingham engineering firm of George Jones, Limited, Mr. HARRY KNIGHT has died at the age of 83. Joining the firm as a draughtsman in 1906, he was made joint manager in 1921, later being appointed a director. Mr. Knight had been managing director for 12 years when he retired in 1959.

The death has taken place of Mr. A. J. W. GRAHAM, 88-year-old managing director of Sheffield Testing Works, Limited. Mr. Graham was formerly chief engineer with Robey & Company, engineers and boilermakers, of Lincoln, and had been responsible for the design and construction of numerous colliery plants. He was made OBE during the first world war, when he was in charge of gun inspection in North-east England.

UNION FEARS STEEL RECESSION

IN a statement issued on Tuesday, Mr. J. O'Hagan, general secretary of the National Union of Blastfurnacemen, Ore Miners, Coke Workers, and Kindred Trades, draws attention to the "serious danger" of a recession in the iron and steel industry. The industry was now working at about 78 per cent. of capacity and the position was not one that gave rise to complacency for, in fact, within the last few weeks it had deteriorated very rapidly.

"This is a bad thing for every one of us in the industry" Mr. O'Hagan states, "and from inquiries made there does not seem to be any fixed plan for getting us out of this impasse. I sometimes wonder where all the ballyhoo used in the election about denationalization of the industry has gone to."

Later, Mr. B. Pendlington, Cleveland and Durham district secretary of the union, stated that in the north-east only 15 out of the 27 blast furnaces were in operation.

Venezuela Seeks Loan for Steel Plant

VENEZUELAN Government is seeking a $50,000,000 loan from the Italian Government for the completion of the Orinoco steel plant, which is being built by the Innocenti Company. It is reported that the loan the Venezuelans are now seeking concerns mainly equipment, supplies, etc., needed for the plant to be able to go into production, rather than for its actual construction.

The Innocenti Company plans to complete construction by the end of next year and the plant will have a basic capacity of 750,000 tons of crude steel, expandable to 1,500,000 tons, and it will also manufacture 300,000 tons of seamless steel pipes a year. When completed the plant will be operated by an American company.

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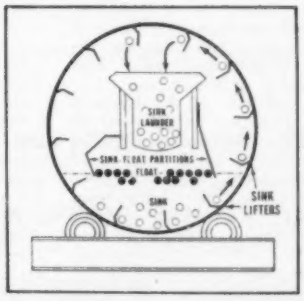

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NEWS IN BRIEF

OWING TO a shortage of orders, about 80 men employed at the Rookhope (Co. Durham) lead ore and fluorspar mine of the Weardale Lead Company, Limited, have been placed on a three-day week.

AT ITS HAMILTON (Ontario), works, the Steel Company of Canada, Limited, is to instal a new wide cold-rolling mill capable of producing cold-rolled sheets up to 72 in. wide, a width not previously produced in Canada.

AN INTERNAL BUS SERVICE at its 3½-mile long Spencer Steelworks, at Llanwern, near Newport (Mon), has been requested by Richard Thomas & Baldwins, Limited. Newport Council is to be asked to provide the service.

THROUGH A SUBSIDIARY, the Castle Firebrick Company, Limited, John Summers & Sons, Limited, steelmakers, of Shotton (Ches), is to extend its brickmaking activities by the purchase of Penybont Brickworks, Ruabon (Denbighshire).

NEW BRANCH premises of S. N. Bridges & Company, Limited, manufacturers of portable electric tools and thread cutting dies, of London, S.W.11, were opened in Glasgow on Monday by Mr. G. N. Bridges, managing director of the company.

URGENT APPEAL for new industries to replace the Pontardawe Steelworks, which Richard Thomas & Baldwins, Limited, has said must close soon, has been made by the local industrial development committee to the Development Corporation for Wales.

NEWPORT RIVET COMPANY, LIMITED, Newport (Mon), celebrates 50 years of business this week. The firm was founded on October 10, 1911, by Mr. Frederick A. Williams, the first managing director and a local engineer, together with three other businessmen.

TEST BORINGS in the Bristol Channel are being made this week to discover if it would be at all possible to build an ore terminal in the channel, from which iron ore could be taken direct to the Spencer steelworks of Richard Thomas & Baldwins, Limited, at Llanwern (Mon).

PERMISSION to go ahead with a £500,000 prefabrication shop extension has been granted to the Fairfield Shipbuilding & Engineering Company, Limited, Glasgow. It is the last phase of the company's £4,000,000 modernization scheme which has been phased over 10 years.

DISPLAY OF WIRE ROPES made by Martin, Black & Company (Wire Ropes), Limited, Coatbridge, Scotland, leaves on October 21 on a tour of Common Market countries. It forms part of an exhibition by a group of Scottish companies under the title of "This is Scotland."

FOUR EMPLOYEES of the Whitehead Iron & Steel Company, Limited, Newport (Mon), were presented by Mr. G. H. Latham, chairman and managing director, with cheques, for suggestions made by the men to improve their own jobs. Eight employees with 30 years' service were presented with watches.

SPEAKING AT the conference dinner of the Institute of Quarrying at Torquay on Tuesday, the Minister of Power, Mr. Richard Wood, said the industry had a considerably higher fatal accident rate than coal mining. The industry now produced each year about the same amount of mineral as the coal-mining industry.

LARGEST COLLECTION of gas-fired industrial installations ever housed under one roof in the North-west will be exhibited by the North Western Gas Board at the City Hall, Manchester, from October 17-26 as a special section of the Industrial Equipment Exhibition. No less than 41 industrial firms from all over the UK have lent gas-fired equipment for the exhibit.

THREE TOP French marketing experts are coming to London on October 30 and 31, to tell British businessmen of the vast potential market for British products in France and to give advice on how these markets can be captured. The London School of Marketing is flying over the experts who will speak at two one-day study sessions at the Connaught Rooms, London.

STEEL ERECTORS worked all through last weekend to erect a 150-ft.-long steel bridge above the dual carriageway of the new Smallbrook ringway at Birmingham. John Laing & Son, Limited, designed the bridge, and the steelwork was specially constructed at Scunthorpe (Lincs), by United Steel Structural Company, Limited, branch of the United Steel Companies, Limited.

FROM NOVEMBER 1, 1961, the telephone number of the Gresham Lion group of companies, Hanworth (Middx), will be changed to Feltham 3655. The telephone number of Gresham Transformers, Limited (small transformer division), will continue to be Feltham 6661 and the two numbers will share in the new arrangements with the General Post Office for 25 lines.

THE PARTY OF 20 French steel engineers who have been on a five-day tour of British industrial centres visited two Sheffield works on Thursday of last week. In the morning they went to the Ecclesfield works of the Brightside Foundry and Engineering Company, Limited, and in the afternoon to the Shepcote Lane rolling mills and works of Firth-Vickers Stainless Steels, Limited.

A FACTORY formerly occupied by Lee Guinness, Limited, at Comber Road, Newtownards (Co. Down), has been acquired by Allen West & Company, Limited, the British electric motor control gear manufacturers. Continuity of employment will be offered to the existing factory personnel and it is expected that the number of employees will be brought up to about 400 within three or four years.

ADDITIONAL STORAGE SPACE at the Swansea premises of Fursland & Pressdee, Limited, recently appointed South Wales distributors for the Goodyear Tyre & Rubber Company (Gt. Britain), Limited, has resulted in the firm carrying the largest stock of hose in South Wales. Over 100,000 ft. of Goodyear hose is stored as well as other Goodyear products including V-belts, transmission belts, etc.

THE £1,500,000 extension to the works of W. H. A. Robertson & Company, Limited, builders of rolling mills for ferrous and non-ferrous metals, etc., of Bedford, a member of Tube Investments, Limited, engineering division, which was held up in June, is now being resumed and should be completed by the end of 1962. The hold-up was due to the shortage of skilled labour and difficulties foreseen in manning the extensions.

REPORTING well-filled order-books until the end of this year, the Dutch steelmakers, Koninklijke Nederlandsche Hoogovens en Staalfabrieken, NV, warn that competition in several markets, particularly oversea, has increased in recent months and prices are being affected. A few weeks ago the Hoogovens German subsidiary, Dortmund-Hörder Hüttenunion, announced a reduction in steel production by about 10 per cent. as a temporary measure.

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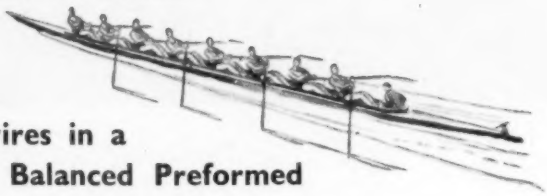

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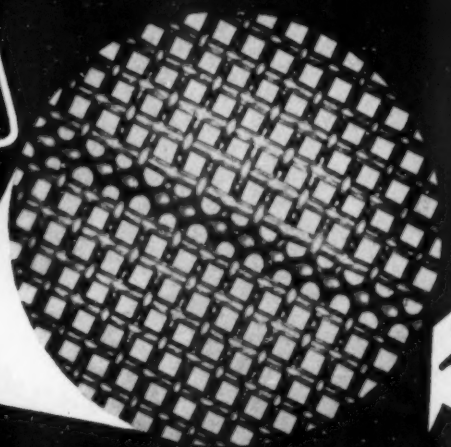

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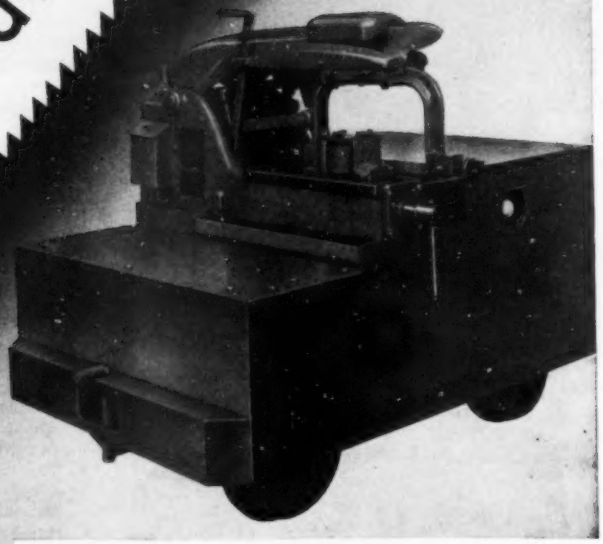

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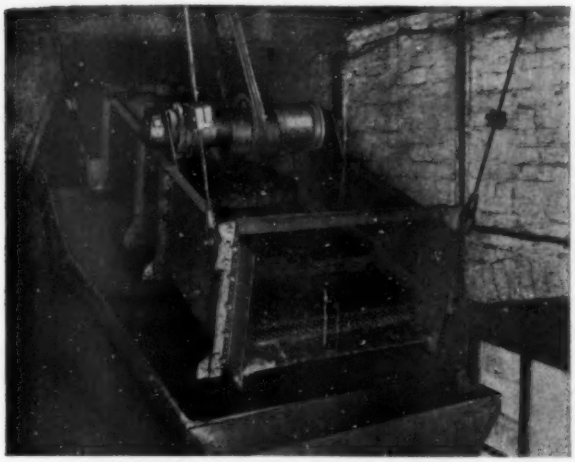

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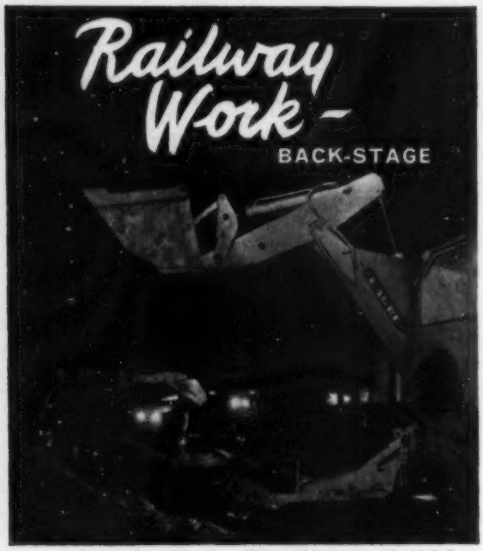

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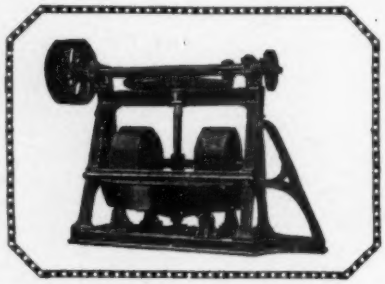

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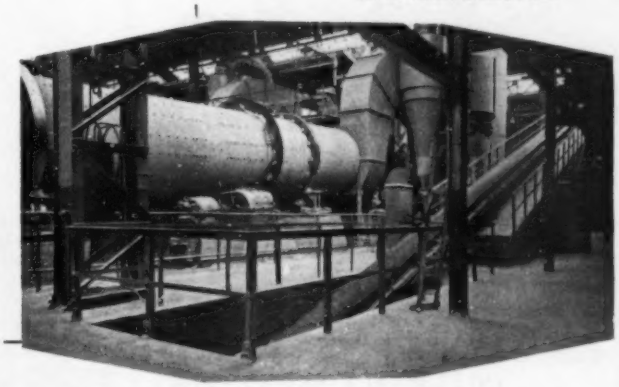

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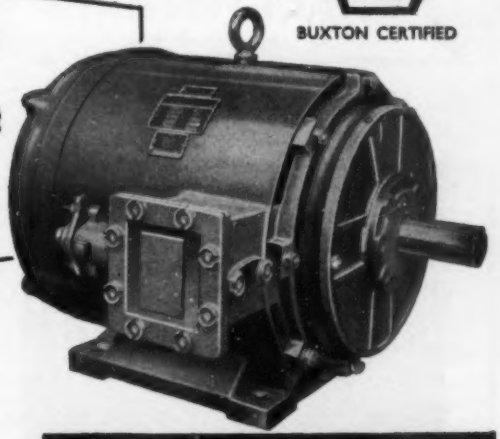

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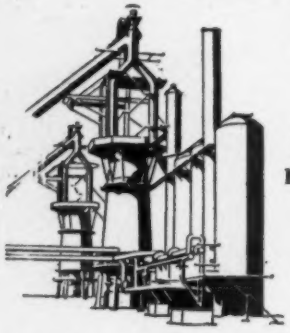

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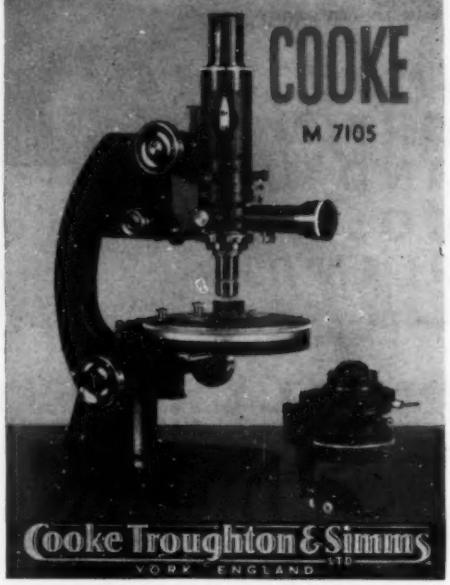

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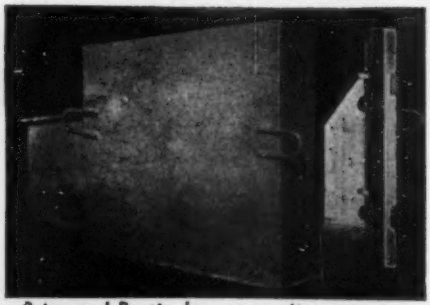

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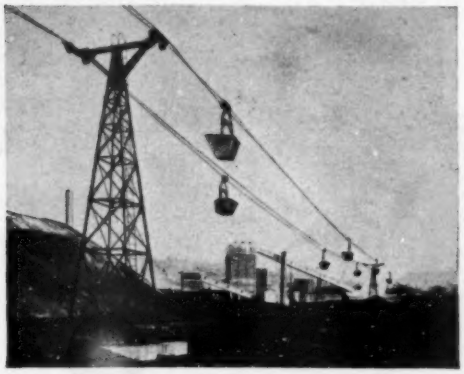

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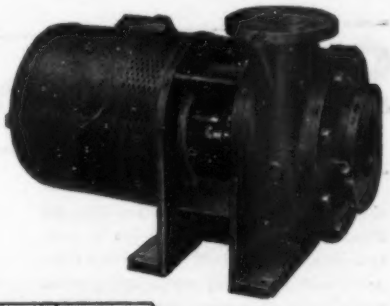

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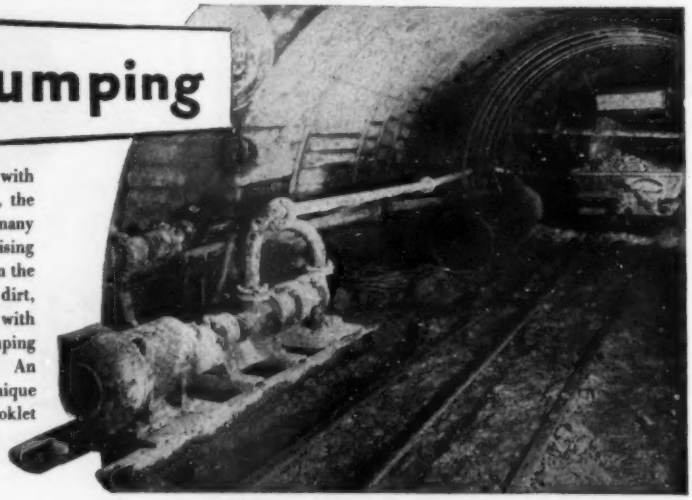

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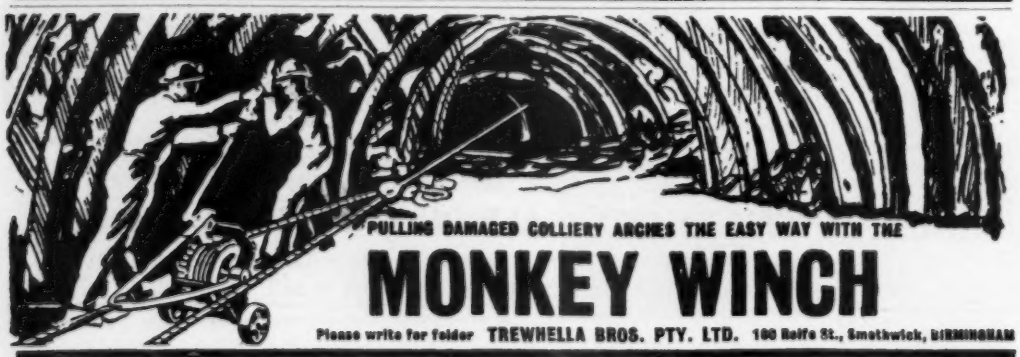

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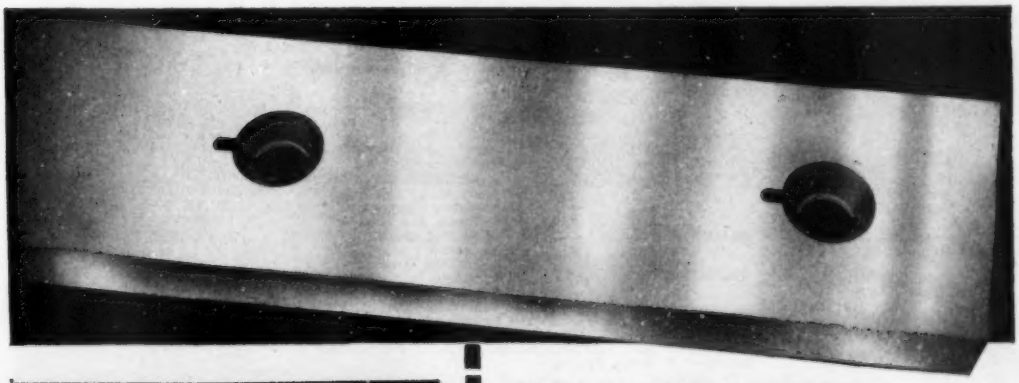

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Johnson Rolls Ltd. .. .. —
Jones, W. Stanley (Engineers) Ltd. .. .. .. —
Joy, Sullivan Ltd. .. .. —

Kennedy, Allan & Co. Ltd. .. —
Kenyon, Wm. & Sons Ltd. .. —

Lafarge Aluminous Cement Co. Ltd. 51
Lanarkshire Steel Co. Ltd. .. —
Lancaster & Tonge Ltd. .. —
Lane, Francis & J. S. Ltd. .. —
Ledward & Beckett Ltd. .. —
Lever, J. & Sons Ltd. .. —
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Mackley, E. N. & Co. Ltd. .. —
M. & C. Switchgear Ltd. .. —
Markham & Co. Ltd. .. .. —
Marshall, Thos. & Co. (Loxley) Ltd. 54
Martin Black & Co. (Wire Ropes) Ltd. 56
Massey, B. & S. Ltd. .. .. —
Mastabar Mining Equipment Co. Ltd. 45
Mather & Platt Ltd. .. .. —
Matthews & Yates Ltd. .. —
Mavor & Coulson Ltd. .. —
McClure, David Ltd. .. .. —
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Merer Ltd. .. .. .. —
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Moler Products Ltd. .. .. —
Mond Nickel Co. Ltd. .. .. —
"Monitor" Patent Safety Devices Ltd. .. .. —
Mono Pumps Ltd. 64
Moorwood, John M. Ltd. .. —
Morgan Refractories Ltd. .. —
Morris, Robert Ltd. .. .. —
Murex Welding Processes Ltd. —
Muschamp, N. J. & Co. Ltd. .. —

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Niagara Screens & Plant Ltd. —
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Norton Harty Engineering Co. Ltd. .. .. —
Norton, Sir James Farmer & Co. Ltd. .. .. .. —
Nortons Tividale Ltd. .. —

Oldham & Son Ltd. .. .. —
Ormerod, Edward & Co. Ltd. 38
Osborn, S. & Co. Ltd. .. .. —
Oughtibridge Silica Firebrick Co. Ltd. .. .. .. —

Padley & Venables Ltd. .. —
Parsons, C. A. & Co. Ltd. .. —
Parsons Chain Co. Ltd. .. —
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Priest Furnaces Ltd. .. .. —
Prolloy Mining Developments Ltd. .. .. —
Protector Lamp & Lighting Co. Ltd. .. .. .. —
Pulsometer Eng. Co. Ltd. .. 53

Qualter Hall & Co. Ltd. .. 41

Railko Ltd. .. .. .. —
Railway & General Engineering Co. Ltd. .. .. —
Ransomes & Marles Bearing Co. Ltd. .. .. .. —
Rapid Magnetic Ltd. .. .. —
Reavell & Co. Ltd. .. .. —
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Reside, Jas. Ltd. .. .. —
Reyrolle, A., & Co. Ltd. .. —
Rheolaveur General Construction Ltd. .. .. .. —
Rhodes, S. & Co. Ltd. .. 62
Rhymney Engineering Co. Ltd. —
Richards, Chas. & Sons Ltd. .. —
Richards Structural Steel Co. Ltd. .. .. —
Richardsons Westgarth Atomic Ltd. .. .. —
Richardsons Westgarth (Hartlepool) Ltd. .. .. .. —
Ride & Bell Ltd. .. .. —
Rigley, Wm. & Sons Ltd. .. —
Robertson, W. H. A. & Co. Ltd. 36
Robey & Co. Ltd. .. .. —
Rocol Ltd. .. .. .. —
Rolled Steel Products (London) Ltd. .. .. .. —
Ropeways Ltd. 63
Ross Engineers Ltd. .. .. —
Round Oak Steel Works Ltd. —
Ruston & Hornsby Ltd. .. —

Sack, Maschinenfabrik, G.m.b.H. .. .. .. —
Safety in Mines Developments Ltd. .. .. —
Salem-Brosius (England) Ltd. —
Saunders Valve Co. Ltd. .. 63
Sentinel (Shrewsbury) Ltd. .. —
Shaw, W. & Co. Ltd. .. .. —
Sheepbridge Equipment Ltd. —
Sheffield Twist Drill & Steel Co. Ltd. 13
Sheffield Wire Rope Co. Ltd. —
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Siemens-Schuckert (G.B.) Ltd. —
Silvertown Rubber Co. Ltd. .. —
Simon-Carves Ltd. .. .. —
Simon, Richard & Sons Ltd. .. —
Siskol Machines Ltd. 58
Skefko Ball Bearing Co. Ltd. —
Skiningrove Iron Co. Ltd. .. —
Smallman, Jas. W. Ltd. .. —
Smedley Bros. Ltd. 60
Smith & McLean Ltd. 67
Smith, John (Keighley) Ltd. .. —
Smith, Thos. & Son (Rodley) Ltd. 22
Spencer-Bonecourt-Clarkson Ltd. .. .. —
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Steam & Combustion Engineering Ltd. .. .. .. —
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Steels Engineering Products Ltd. .. .. —
Steelway Ltd. .. .. .. —
Stein & Atkinson Ltd. .. 69
Stein, J. G. & Co. Ltd. .. —
Stephens Silica Brick Co. Ltd. —
Stewarts and Lloyds Ltd. .. —
Stockdale Engineering Co. Ltd. —
Stoddard, J. & Sons Ltd. .. —
Stone-Wallwork Ltd. .. .. —
Stothert & Pitt Ltd. .. .. —
Strachan & Henshaw Ltd. .. —
Structural Painters Ltd. .. —
Sturdy Electric Co. Ltd. .. 67
Summerson, Thos. & Sons Ltd. —
Sutcliffe, Richard Ltd. .. 39
Sutcliffe, Speakman & Co. Ltd. 16

Tattersall & Sons Ltd. .. 62
Taylor, F. & Sons (Manchester) Ltd. 17
Tees Side Bridge & Engineering Works Ltd. .. .. —
Thermal Syndicate Ltd. .. —
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Thompson, John Conveyor Co. —
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Thompson & Southwick Ltd. —
Thornton, B., Ltd. .. .. —
Thyssen Shaft Sinking Co. Ltd. —
Town, Fredk. & Sons Ltd. .. —
Trewhella Bros. (Pty.) Ltd. .. 64
Tungsten Carbide Developments Ltd. .. .. .. —
Turner Bros. Asbestos Co. Ltd. .. .. —

Underground Mining Machinery Ltd. .. .. .. —
Unifloc Ltd. .. .. .. —
United Fireclay Products Ltd. 18
United States Metallic Packing Co. Ltd. .. .. —
United Steel Companies Ltd. —
United Wire Works Ltd. .. 57
Ukside Engineering Co. Ltd. —

Vallak, G. B. Ltd. .. .. —
Vaughan Crane Co. Ltd. .. —
Vauxhall Motors Ltd. .. .. —
Victor Products (Wallsend) Ltd. .. .. —
Visco Limited .. .. .. —

Wade, Smith & Co. Ltd. .. —
Wailes Dove Bitumastic Ltd. 55
Walker Bros. (Wigan) Ltd. .. —
Wallacetown Engineering Co. Ltd. .. .. —
Wallsend Slipway & Engineering Co. Ltd. .. .. .. —
Walmsleys (Wigan) Ltd. .. —
Ward, Thos. W. Ltd. 63
Warner & Co. Ltd. .. .. —
Wean-Miles Ltd. .. .. —
Wellman Bibby Co. Ltd. .. —
Wellman Smith Owen Engineering Corporation Ltd. .. 37
West Bromwich Spring Co. Ltd. —
Westinghouse Brake & Signal Co. Ltd. 34
West's (Manchester) Ltd. .. 49
West's Piling & Construction Co. Ltd. .. .. .. —
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Wharton Crane & Hoist Co. Ltd. .. .. —
Whipp & Bourne Ltd. .. .. —
White, R. & Sons (Engrs.) Ltd. —
Whittaker, C. & Co. Ltd. .. 53
Wickman Ltd. 23
Widnes Foundry & Engineering Co. Ltd. .. .. .. —
Wigglesworth, F. & Co. Ltd. .. —
Wild, A. G. & Co. Ltd. .. .. —
Wild, M. B. & Co. Ltd. .. .. —
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Wolseley Holdings Ltd. .. .. —
Wombwell Foundry & Engineering Co. Ltd. .. .. .. —
Wood, Hugh & Co. Ltd. .. 11
Woodall-Duckham Construction Company Limited .. .. —
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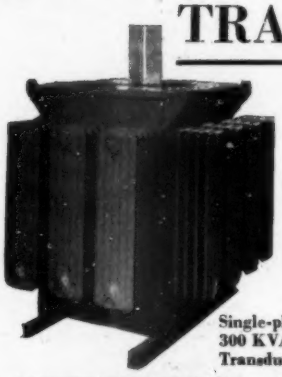

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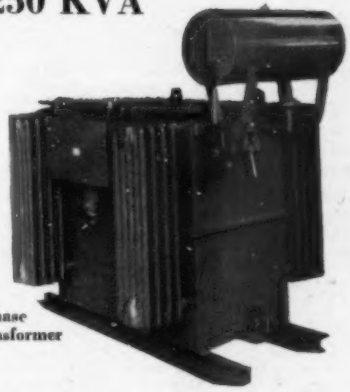

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Aveling-Barford Ld. .. .. —

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Barker, Davies & Co. .. —
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Bathgate, Richard A. .. 8
Bayliss, Jones & Bayliss Ld. —
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Beldam Asbestos Co. Ld. .. —
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Belmos Co. Ld. .. .. —
Beresford, Jas. & Son Ld. .. —
Birkett, Billington & Newton Ld. .. .. .. —
Birlec-Efco (Melting) Ld. .. 46
Birtley Engineering Ld. .. 1
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Blandford-Gee Cementation Co. Ld. .. .. .. —
Blantyre Engineering Co. Ld. —
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Cleveland Bridge & Engineering Co. Ld. .. .. .. —
Cohen, Geo. Sons & Co. Ld. .. 70
Colvilles Ld. 12
Conflow Ld. .. .. .. —
Consett Iron Co. Ld. .. —
Consolidated Pneumatic Tool Co. Ld. .. .. .. —
Cooke, Troughton & Simms Ld. 62
Cooper, Jas. Milne & Co. Ld. 64
Cooper Roller Bearings Co. Ld. —
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Coulson, M. & Co. Ld. .. —
Courtaulds Ld. 27
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Cox & Danks Ld. .. .. —
Crawley Industrial Products Ld. .. .. .. 28 & 29
Cripps, R. & Co. Ld. 26
Croda Ld. .. .. .. —
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Crompton Parkinson Ld. .. —
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Gas Council .. .. .. —
General Electric Co. Ld. .. —
General Refractories Ld. .. 42
Gent & Co. Ld. .. .. —
Gibbons Bros. Ld. .. .. —
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Glover Bros. (Mossley) Ld. .. —
Glover, Wm. Jas. & Co. Ld. 15
Goodall, Clayton & Co. Ld. .. —
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Green, E. & Sons Ld. .. —
Green, Horace & Co. Ld. .. 61
Greening, N. & Sons Ld. .. 6
Guest, Keen Iron & Steel Works 44
Gullick Ld. .. .. .. —
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(*Continued on page* 66)

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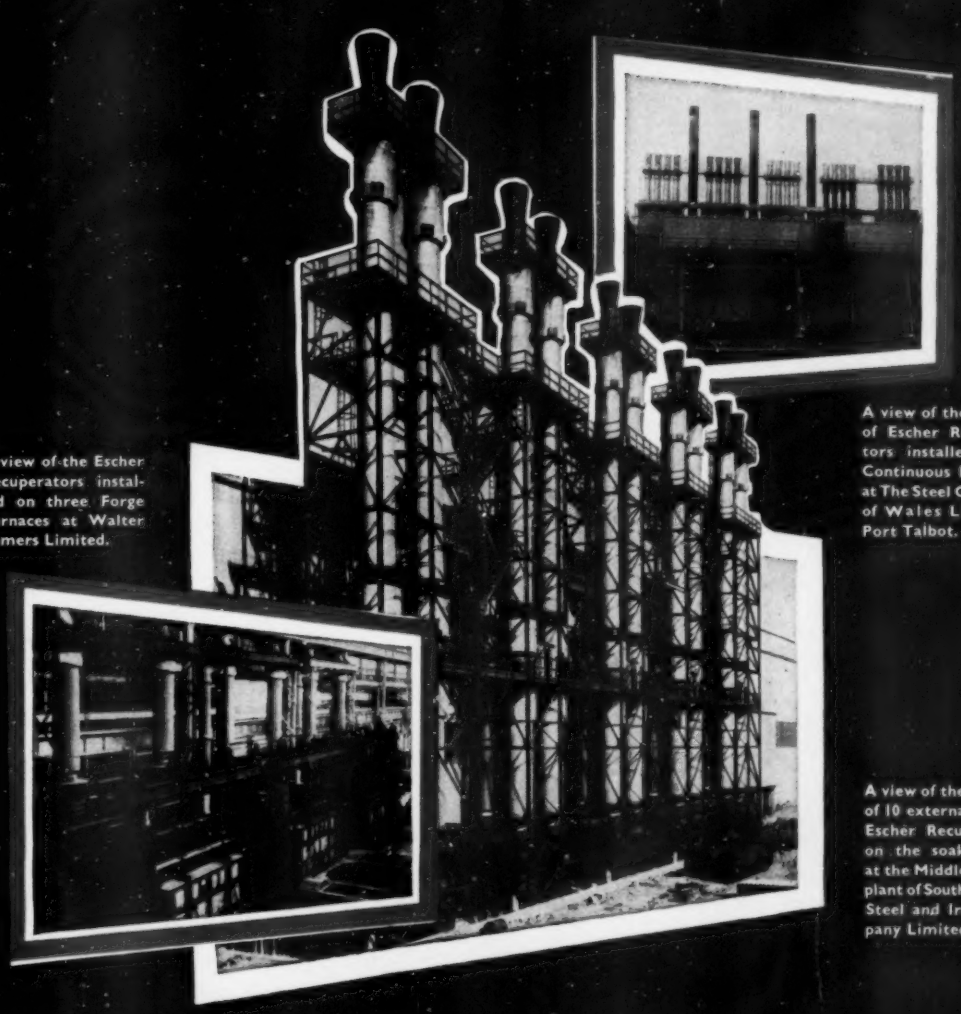

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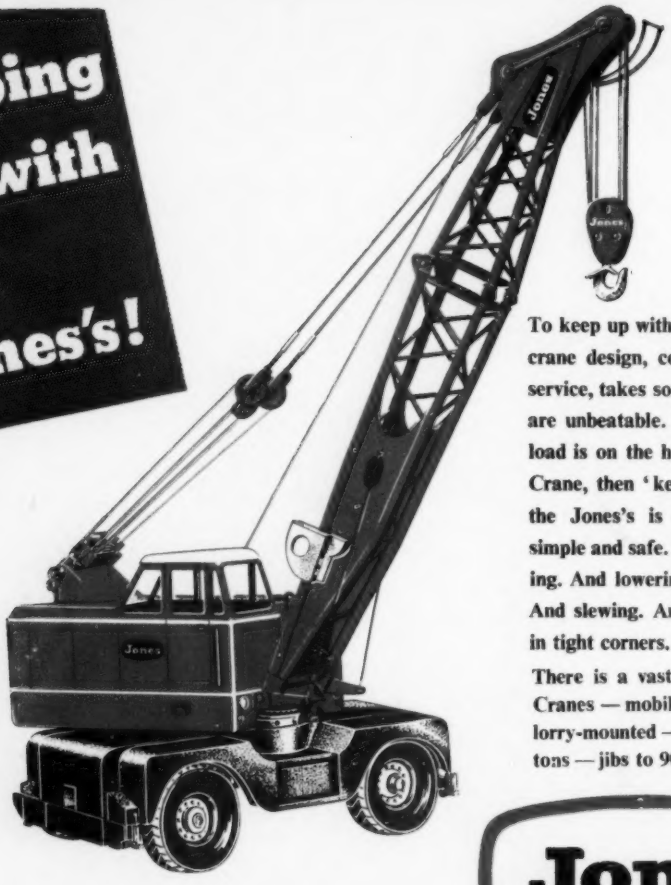

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